





PART 3 Docket LOG  
ADMINISTRATIVE RECORD INDEX

Please Print

Facility Ford-Allen Park Clay Mine Landfill

MID # 980 562 711

<u>Item #</u>	<u>Item Date</u>	<u>Description</u>	<u>Item Filed*</u>
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revisive  
maybe in  
file room



Threatened and endangered species possibly on or near the site should be identified as early as possible.

All maps shall be consistent with the requirements of 40 CFR 270.14 and be of sufficient detail and accuracy to locate and report all current and future work performed at the site.

- d. A history and description of ownership and operation, solid and hazardous waste generation, treatment, storage and disposal activities at the facility;
- e. A summary of past permits requested and/or received, any enforcement actions and the subsequent responses and a list of documents and studies prepared for the facility along with a brief summary of their findings;
- f. A summary of all possible source areas of contamination. At a minimum, this should include all regulated units, solid waste management units identified in Condition III.C. of the facility's permit, any additional solid waste management units, spill areas, and other suspected source areas of contamination including any observed effects to biota (i.e., fish kills, stressed vegetation, or other obvious impacts).

For each area the Permittee shall identify the following:

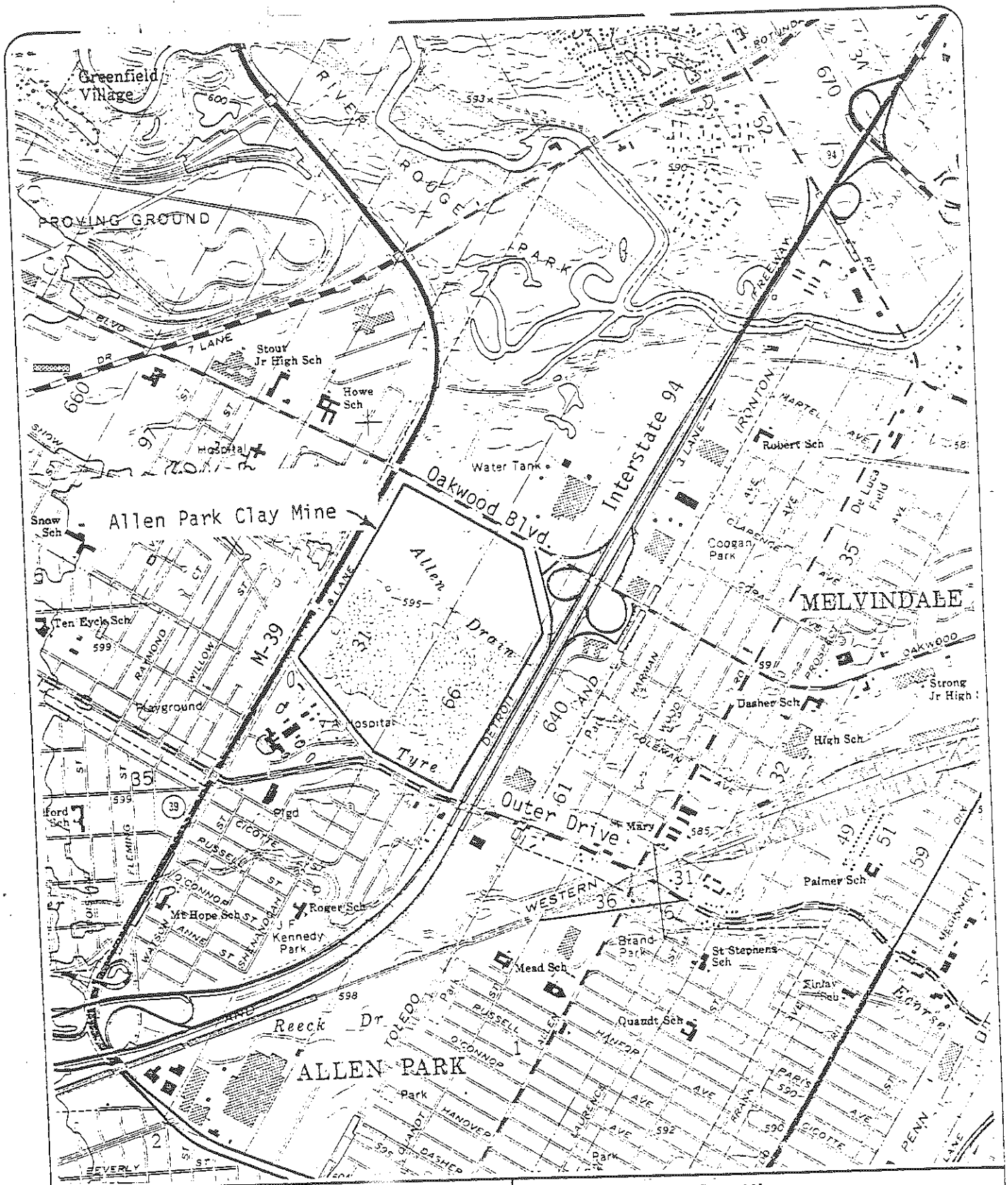
- (1) Location of unit/area;
- (2) Quantities of solid and hazardous wastes;
- (3) Hazardous waste or constituents, to the extent known;
- (4) Approximate dates or periods of past spills, identification of the materials spilled, the amount spilled, the location, and a description of the response actions, including any inspection reports or technical reports generated as a result of the spill;
- (5) Available monitoring data and qualitative information on locations and levels of contamination at the facility; and
- (6) Habitats and species (including threatened and endangered species) potentially exposed to contaminants, and any known or observed effects of site contaminants on biota, such as fish kills or other obvious impacts. Habitat description should be based on available information and a field reconnaissance by a trained ecologist. Experts on local flora and fauna should also be consulted.

4-30-93 Grace Rite: Will state want to agree FPD  
to conduct on testing / capability testing ? let message 3rd

March 31, 1994      Talked to Steve Johnson (TSCA Contact) about the Ford-Monroe PCB sediment cleanup project. Steve said he was getting ready to public notice the Ford-Allen Park 16-page draft TSCA permit. The permit would allow Ford-Monroe to dispose of PCB contaminated sediments from the Raisin River into the Ford-Allen Park landfill. Steve said the permit should be public noticed on April 12, 1994. And the hearing will take place on May 5, 1994. Steve will be meeting with Roger Jones (MDNR Surface Water Quality Div.) on Monday April 4, 1991, to work out some issues. Steve also talked to Pete Quackenbush about the permit and as a result Steve revised some portions of the permit including groundwater monitoring. Steve will send me a copy of the draft TSCA permit via wpo.

Ford-Allen Park      Pete Quackenbush told the company that the MDNR will not be reviewing the Ford-Allen Park license renewal application this fiscal year. This project has been put on hold.





0 1000 2000 3000 4000 5000

Scale - Feet  
Contour Interval 5 Feet  
Datum is Mean Sea Level

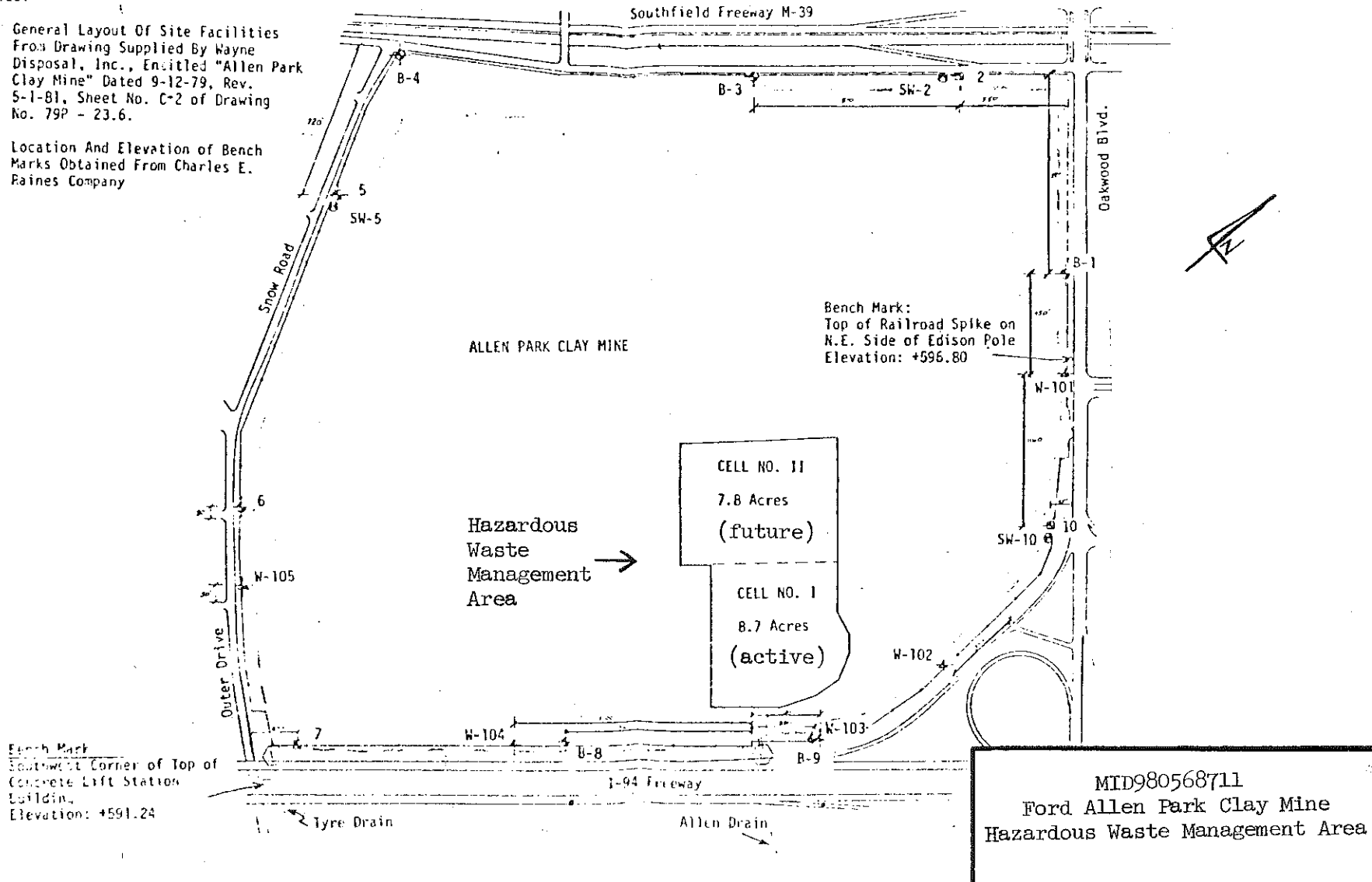
Allen Park Clay Mine  
MTD980568711  
Disposal Landfill  
Allen Park, Michigan  
Wayne County

Specific Site Location

Attachment 2

NOTES:

1. General Layout Of Site Facilities From Drawing Supplied By Wayne Disposal, Inc., Entitled "Allen Park Clay Mine" Dated 9-12-79, Rev. 5-1-81, Sheet No. C-2 of Drawing No. 79P - 23.6.
2. Location And Elevation of Bench Marks Obtained From Charles E. Raines Company



MTD980568711  
Ford Allen Park Clay Mine  
Hazardous Waste Management Area



Listed issues**1) Runoff**

c) Oakwood Blvd./Allen Drain  
25 yr storm discharge

**2) Flood protection**

- a) 100 year
- b) 500 year

**4) Leachate disposal****7) Air Monitoring****8) Good Neighbor Policy**Delisted issues**1) Runoff**

a) 54" water main  
proximity

b) Allen Drain  
Stormwater discharge  
approval expected to  
be granted by DNR

**3) Truck Traffic Paths****5) User Definitions &  
User Geographical limits****6) Mine Subsidence****Discussion**

Although some of these issues listed above are covered in the material you forwarded, there are several things that are new or have not been completed. Such issues need to be addressed or resolved, as the case may be:

- 1b) Runoff to Allen Drain: Routine roadwashing operations at Allen Park Clay Mine Landfill are expected to drain to culverts and to Allen Drain. Review of the Application for a Permit to Discharge Stormwater Discharges Associated with Industrial Activity dated October 1, 1992, signed by J.M. Rintamaki (Ford) Assistant Secretary, does not reveal plans for PCB waste transportation and disposal at Cell II or how roadway wash water will flow to Allen Drain. Although PCBs are not currently being disposed of at this site and there is no approval to do so, granting such an approval may change the conditions under which the NPDES stormwater permit was granted. If a PCB disposal approval is granted, a notice of PCB activity must be

made to the responsible Michigan Department of Natural Resources agency.

- 1c) Runoff to Oakwood Boulevard: Protection from storm/roadwash activities suggests placing a "speedbump" type water barrier across the entrance from screen berm to screen berm.
- 2a) 100 year flood plain boundary: Data and models are required to support the contention that Cell II is not in the 100 year flood plain.
- 2b) Flood Protection - 500 year protection: Per our phone conversation of August 16, 1994, what is the 500 year flood plain? I recommend determination of the 500 year flood elevation for Cell II to prepare for continued public concerns regarding flooding. This is a voluntary issue intended to allay fears of the community.
- 4) Leachate disposal: Until I receive an authorization to discharge leachate from Cell II to the Detroit Water and Sewerage District or an alternate discharge system is accepted, I view the TSCA disposal application as being incomplete. Region 5 will not be able to consider issuing a TSCA disposal approval for Cell II until this matter is resolved. Region 5 recommends demonstrating the impact of Cell II leachate discharge on the National Pollution Discharge Elimination System approval at the Detroit Waste Water Treatment Plant downstream of Allen Park Clay Mine Landfill.
- 7) Air Monitoring plans: TSCA proposes using NIOSH air monitoring criteria at the perimeter monitoring stations for an action level. The air monitoring plan must be submitted.
- 8) Good Neighbor Policy: Because of continued concerns by local municipalities and citizens regarding PCB disposal at Allen Park Clay Mine Landfill, Region 5 strongly recommends that Ford propose a program to improve community relations. This program should include the local mayors and citizen groups. For example, Ford might choose to train citizens chosen by mayors or other groups as volunteer inspectors. Training should include both Ford and community issues. Those who complete a general training program for landfill inspections should then have rights to prepare and use inspection checklists and gain regular access to Cell II, to TSCA monitoring stations, and to TSCA records that relate to Cell II disposal. These checklists would then be made part of the TSCA records

that must be reported quarterly.

Several issues have, however, been answered well enough for TSCA approval purposes, including:

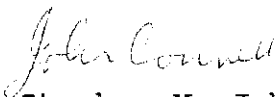
- 1) Runoff to 54" water main: Although the diagrams are unsigned and unreferenced, the information presented in your crosssections A-A' and B-B' Figures 3 and 5, respectively, is superior to the informal categorical objections posed by Detroit Water and Sewerage District (DWSD). Unless DWSD supports its claims, I cannot accept that a PCB chemical pathway exists for contaminating workers or water in and around the 54" water main, but I do recommend placing water barrier "speedbumps" at the entrance to avoid runoff.

Stormwater runoff permits: The Michigan Department of Natural Resources is expected to grant the necessary general permit shortly. When PCBs are accepted at the site, the general permit may need to be changed.

- 3) Traffic: Vehicles loaded with PCB waste will not remain On Site while the landfill is closed. The Wheel Wash Building is not intended to be used by vehicles contaminated by PCB waste.
- 5) Definitions and Geographical Limits: Acceptable to Region 5, per communication of August 17, 1994.
- 6) Mine Subsidence: The report dated August 19, 1994, and phone conversations with John Head on September 15, 1994, support his conclusion that surface subsidence risks at Cell II are not an issue of concern.

Included are checklists of specific items previously listed and their acceptance status, together with a draft TSCA approval that may be useful for preparing applications for Willow Run; and a copy of a Good Neighbor Policy set up by the Solid Waste Agency of Northern Cook County for a controversial waste transfer station. If you have any questions please feel free to contact me at 312-886-1330.

Sincerely,



Stephen M. Johnson, PG  
PCB Control Section

Enclosures

STATE OF MICHIGAN

NATURAL RESOURCES  
COMMISSION

JERRY C. BARTNIK  
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PAUL EISELE  
AMES HILL  
JAVID HOLLI  
JOEY M. SPANO  
JORDAN B. TATTER



JOHN ENGLER, Governor

DEPARTMENT OF NATURAL RESOURCES

John Hannah Building, P.O. Box 30241, Lansing, MI 48909

ROLAND HARMES, Director

August 11, 1994

Ms. Brenda LiveOak  
Oakwood Environmental Concern Association  
2216 College  
Lincoln Park, Michigan 48146

Dear Brenda:

This is in response to your July 19, 1994, letter regarding the regulatory implications under Michigan's Hazardous Waste Management Act, 1979 PA 64, as amended (Act 64), of Ford Motor Company's proposal to dispose of PCB waste in the Allen Park Clay Mine under the federal "Toxic Substance Control Act" (TSCA).

As you are probably aware, several legislators representing the residents in the area surrounding the Allen Park Clay Mine have requested the Attorney General to render an opinion on the issue of whether the proposed TSCA permit would require amendment of the existing Act 64 operating license issued to the facility. The Attorney General's office is currently reviewing this issue and your comments and concerns should be directed to that office at: Attorney General, Law Building, Seventh Floor, P.O. Box 30212, Lansing, Michigan 48909; or at telephone number 517-335-1488.

Waste Management Division staff have discussed the floodplain issue with the Army Corps of Engineers and have been notified that some areas surrounding the facility may be in the 500-year floodplain, but that the facility is not located within the 100-year floodplain. Both the Act 64 and TSCA regulations only place restrictions on facilities located in the 100-year floodplain.

During the licensing of the facility under Act 64 in 1989, Ford indicated in their application that they would only accept a limited number of hazardous waste types generated by Ford owned facilities. The operating license was issued based on these limited hazardous waste types. Ford, however, is permitted by Act 64 to request a modification to their license to allow the acceptance of additional hazardous waste types. Before such a modification could be issued the Department of Natural Resources (Department) would review their application to determine technical compliance with the regulations. In the event the application was determined to





Ms. Brenda LiveOak

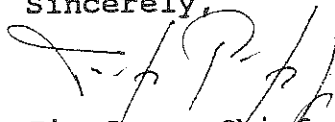
-2-

August 11, 1994

be technically adequate, the Department would then draft an operating license amendment and go through formal public participation prior to making a final determination.

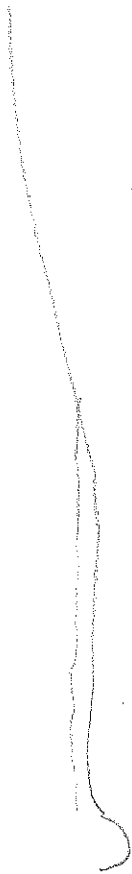
Thank you for providing your concerns. If you have any questions regarding this information, please contact Mr. Peter Quackenbush, Senior Environmental Engineer, Waste Management Division, at telephone number 517-373-7397, or me.

Sincerely,



Jim Sygo, Chief  
Waste Management Division  
517-373-9523

cc: Attorney General Frank Kelley  
Senator George Hart  
Mayor Tom Coogan, City of Melvindale  
Ms. Carol Misseldine, MEC  
Dearborn Snow Woods Association  
Melvindale Environmental Concern Association  
Mr. Steve Johnson, U.S. EPA  
Mr. Richard Traub, U.S. EPA  
Ms. Lorraine Kosik, U.S. EPA  
Mr. Russell Harding, DNR  
Ms. Mindy Koch, DNR  
Mr. Ken Burda, DNR\HWP C&E File  
Dr. Ben Okwumabua, DNR-Livonia  
Mr. Peter Quackenbush, DNR



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DEPARTMENT OF NATURAL RESOURCES

John Hannah Building, P.O. Box 30241, Lansing, MI 48909

ROLAND HARMES, Director

August 16, 1994

Ms. Kathy Milberg  
Southwest Detroit Environmental Vision Project  
P.O. Box 009400  
Detroit, Michigan 48209

Dear Ms. Milberg:

Attorney General Frank Kelley has asked me to respond to your July 19, 1994, letter regarding Ford Motor Company's (Ford) proposal to dispose of polychlorinated biphenyl (PCB) waste in the Allen Park Clay Mine under the federal Toxic Substance Control Act (TSCA).

Under TSCA, Ford has the ability to apply to the United States Environmental Protection Agency (U.S. EPA) for a permit for disposal of PCB waste at the Allen Park Clay Mine. The U.S. EPA is required to review the application to determine if the proposed disposal satisfies the regulatory requirements of TSCA. The U.S. EPA's decision on whether to issue the permit will be based on the technical merits of the application and the relevant public comments regarding technical compliance under the TSCA regulations.

The Department of Natural Resources has reviewed the draft TSCA permit and provided the U.S. EPA with comments regarding compliance with TSCA and the existing license issued to the facility pursuant to Michigan's Hazardous Waste Management Act, 1979 PA 64, as amended (Act 64).

As you are probably aware, several legislators representing the residents in the area surrounding the Allen Park Clay Mine have requested the Attorney General to render an opinion on the issue of whether the proposed TSCA permit would require amendment of the existing Act 64 operating license issued to the facility. The Attorney General's office is currently reviewing this issue.





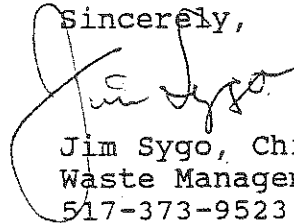
Ms. Kathy Milberg

-2-

August 16, 1994

Thank you for providing your concerns. If you have any question regarding this information, please contact Mr. Peter Quackenbush, Senior Environmental Engineer, Waste Management Division, at telephone number 517-373-7397, or me.

Sincerely,



Jim Sygo, Chief  
Waste Management Division  
517-373-9523

cc: Attorney General Frank Kelley  
Mr. Michael Leffler, DAG  
Mr. Steve Johnson, U.S. EPA  
✓ Mr. Richard Traub, U.S. EPA  
Ms. Lorraine Kosik, U.S. EPA  
Mr. Kenneth Burda, DNR\HWP C&E File  
Dr. Ben Okwumabua, DNR-Livonia  
Mr. Peter Quackenbush, DNR



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STATE OF MICHIGAN



JOHN ENGLER, Governor

DEPARTMENT OF NATURAL RESOURCES

John Hannah Building, P.O. Box 30241, Lansing, MI 48909

ROLAND HARMES, Director

RECEIVED

DEC 27 1994

December 21, 1994

OFFICE OF RCRA  
WASTE MANAGEMENT DIVISION  
EPA. REGION V

Mr. Richard Traub (HRP-8J)  
Michigan Permits Unit  
U.S. EPA-Region 5  
77 West Jackson Boulevard  
Chicago, Illinois 60604-3590

Dear Mr. Traub:

SUBJECT: Receipt of an Act 64 Operating License Renewal  
Application for Ford Motor Company, Allen Park  
Clay Mine; MID 980 568 711

The Waste Management Division has received a hazardous waste management facility operating license renewal application from the Ford Motor Company for the Allen Park Clay Mine facility located in Allen Park, Michigan. The facility was originally issued a license on May 8, 1989. That license expired on May 8, 1994. Enclosed are copies of the operating license renewal application and the public notice announcing its receipt. The public notice appeared in the News Herald on December 18, 1994.

Mr. Peter Quackenbush, the permit engineer responsible for the review of this application, is coordinating the reviews of the appropriate agencies. Please have your staff review the application and provide Mr. Quackenbush with their technical review comments by February 3, 1995. Thank you for your cooperation in this matter. If you have any questions or comments, please contact Mr. Quackenbush at 517-373-7397.

Sincerely,

Kenneth J. Burda, Chief  
Hazardous Waste Program Section  
Waste Management Division  
517-373-0530

Enclosure

cc: Ms. Lorraine Kosik, U.S. EPA  
Ms. Shari Sutker, U.S. EPA  
Mr. Larry AuBuchon/Mr. Christopher Silva, DNR-Livonia  
Operating License File



RECEIVED  
JAN 10 1964

RECEIVED

OFFICE OF THE  
ATTORNEY GENERAL  
WASHINGTON, D.C.

PUBLIC NOTICE

RECEIPT OF AN OPERATING LICENSE RENEWAL  
APPLICATION FOR THE FORD ALLEN PARK CLAY MINE  
HAZARDOUS WASTE MANAGEMENT FACILITY

The Michigan Department of Natural Resources (MDNR) and the United States Environmental Protection Agency (U.S. EPA), Region 5, hereby give notice that the Ford Motor Company (Ford) has submitted an operating license renewal application for the Allen Park Clay Mine. On May 8, 1989, Ford was issued a Michigan Hazardous Waste Management Act, 1979 PA 64, as amended, (Act 64) operating license. That license expired on May 8, 1994. Although Ford's license to operate the Allen Park Clay Mine facility has expired, the company submitted a timely renewal application whereby Act 64 Administrative Rules allow the facility to continue to operate under the standards and requirements of the existing license until the MDNR reissues or denies the license.

Ford operates a hazardous waste landfill facility located at Oakwood Boulevard and Southfield Freeway in Allen Park, Michigan. The MDNR is authorized under the federal Resource Conservation and Recovery Act (RCRA) to issue and deny licenses for the operation of hazardous waste management facilities, except for the portion of the license which relates to the 1984 Hazardous and Solid Waste Amendments (HSWA) to RCRA. The HSWA mandates, in part, that hazardous waste management licenses issued after November 8, 1984, require corrective action for all releases of hazardous waste or hazardous constituents to the environment from any solid waste management units at treatment, storage, or disposal facilities seeking licenses. The U.S. EPA, in cooperation with the MDNR is responsible for making a final determination on the HSWA portion of the application. Thus, until the MDNR receives authorization to administer the HSWA portion of the RCRA program, reviews of applications and issuance or denial of licenses and permits will be conducted jointly.

The MDNR and U.S. EPA staff are currently reviewing the renewal application to determine if it is complete and technically satisfies all state and federal hazardous waste facility licensing requirements. If the application is found to be incomplete, the missing information will be requested from the applicant and the municipalities will be so notified. As soon as the missing information is provided, the MDNR will notify the municipalities and proceed with the technical review of the application. Based upon this review, the MDNR and U.S. EPA will propose to reissue or deny the operating license. Prior to a final determination, a public hearing will be held regarding the tentative decision.

A notice will appear in this publication approximately 30 days prior to the hearing date. At this time, the MDNR and U.S. EPA are soliciting public comments on the adequacy of the application, the proposed corrective action program, and any issues associated with the facility's past operation.

Ford's renewal application is available for inspection at the MDNR, Southeast Michigan District Headquarters, located at 38980 Seven Mile Road in Livonia, Michigan (contact Mr. Christopher Silva at 313-953-1457); and the Allen Park Public Library, located at 8100 Allen Road in Allen Park, Michigan. The renewal application is also available for review at the MDNR, Waste Management Division Office located on the first floor of the John A. Hannah Building in Lansing, Michigan (contact Mr. Peter Quackenbush at 517-373-7397); and at the U.S. EPA Region 5 Office, RCRA Permitting Branch, located at 77 West Jackson Boulevard in Chicago, Illinois (contact Ms. Shari Sutker at 312-886-6151). Copies of the application may be obtained from the Waste Management Division for the cost of reproduction. Send your request and mailing address to Ms. Marcia Baldermann at the address below.

To receive future departmental notifications concerning this facility, please submit a written request for placement on the Ford Motor Company, Allen Park Clay Mine operating license reapplication mailing list to Ms. Marcia Baldermann at the address below. Be sure to include your correct mailing address. Questions regarding the facility should be addressed to:

Mr. Peter Quackenbush  
Michigan Department of Natural Resources  
Waste Management Division  
P.O. Box 30241  
Lansing, Michigan 48909  
517-373-7397

RECEIVED

JUL 5 1995

OFFICE OF RCRA  
WASTE MANAGEMENT DIVISION  
EPA, REGION V



Environmental and Safety Engineering Staff  
Ford Motor Company

Suite 602  
15201 Century Drive  
Dearborn, Michigan 48120

June 26, 1995

U.S. EPA - Region V, HRP-8J  
Technical Permits Section, Michigan Unit  
77 W. Jackson Blvd  
Chicago, Illinois 60604

Subject: **Ford Motor Company**  
**Allen Park Clay Mine Landfill - MID 980 568 711**  
**Response to MDNR Technical Notice of Deficiency**

Technical Permits Section:

Two copies of revisions to the Michigan Department of Natural Resources (MDNR) Act 451 (Part 111) Operating License and Federal HSWA Permit renewal application for the Allen Park Clay Mine Landfill are being submitted to you separately by RMT, Inc. of Madison, Wisconsin. These revisions are submitted in response to the May 9, 1995 Technical Notice of Deficiency issued by Mr. Peter Quackenbush of the MDNR Waste Management Division. Revisions are assembled using the "replacement page" format as requested. Additional instructions are provided to facilitate the substitution of revised pages for original pages. Pursuant to discussions with Mr. Quackenbush of MDNR, the Cell II liner evaluation work plan is under development and will be submitted at a later date.

Seven copies of these revisions have been submitted to the MDNR.

Should you have any questions concerning this submittal, please contact Jeff Hartlund of this Office at 313/322-0700.

Sincerely,

Jerome S. Amber, P.E., Manager  
Site Management and Investigation  
Environmental Quality Office  
313/322-4646

Enclosures

cc: MDNR Waste Management Division (w/out attachments)  
Mayors of Allen Park, Dearborn and Melvindale (w/out attachments)

711-15





STATE OF MICHIGAN



NATURAL RESOURCES COMMISSION

LARRY DEVUYST  
PAUL EISELE  
MARLENE J. FLUHARTY  
ORDON E. GUYER  
VID HOLLI  
J. STEWART MYERS  
RAYMOND POUPORE

JOHN ENGLER, Governor

DEPARTMENT OF NATURAL RESOURCES

STEVENS T. MASON BUILDING  
P.O. BOX 30028  
LANSING, MI 48909

ROLAND HARMES, Director

April 1, 1992

Mr. Jerome Amber, P.E., Manager  
Industrial Waste and Toxic/  
Hazardous Substances  
Environmental Quality Office  
Ford Motor Company  
Suite 608  
15201 Century Drive  
Dearborn, Michigan 48120

Dear Mr. Amber:

SUBJECT: Cell II Dewatering and Cell Floor Repair  
Certification Ford Allen Park Clay Mine Landfill  
MID 980 568 711

The Waste Management Division has reviewed the Cell II dewatering and floor repair certification and documentation submitted on September 18, 1991 in accordance with the Act 64 operating license issued to Ford Motor Company for the Allen Park Clay Mine Landfill. The program satisfies Condition III.C.1.b of the operating license and is hereby approved.

If you have any questions regarding this approval, please contact Mr. Peter Quackenbush at Waste Management Division, Department of Natural Resources, P.O. Box 30241, Lansing, Michigan 48909, or at telephone number 517-373-7397.

Sincerely,

A handwritten signature in cursive script that reads "Dennis M. Drake".

Dennis M. Drake, Acting Chief  
Waste Management Division  
517-373-9523

cc: ✓ Mr. Richard Traub, U.S. EPA  
Mr. Steve Buda, DNR  
Mr. Peter Quackenbush, DNR  
Mr. Kurt Childs, DNR-Livonia  
HWP/C&E File

711-30





DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Agency for Toxic Substances  
and Disease Registry  
Atlanta GA 30333

March 28, 1994

Shari Kolak  
Office of RCRA  
77 W. Jackson Blvd. (HRP/8J)  
Chicago, Illinois 60604

Dear Shari:

Here are two (2) copies of the Public Health Assessment for the following site:

Allen Park Clay Mine

Please keep one copy for your personal files and place the other copy in your site repository.

If you have any questions, please feel free to contact me at (312) 886-0840.

Sincerely,

*L. Fabinski (pg)*

Louise Fabinski  
Senior Regional Representative

pg:ATSDR:10/93

70-77



NATURAL RESOURCES  
COMMISSION

JERRY C. BARTNIK  
LARRY DEVUYST  
UL EISELE  
JES HILL  
DAVID HOLLI  
JOEY M. SPANO  
JORDAN B. TATTER

STATE OF MICHIGAN



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DEPARTMENT OF NATURAL RESOURCES

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ROLAND HARMES, Director

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JUL 20 1993

OFFICE OF RCRA  
WASTE MANAGEMENT DIV  
EPA, REGION V

July 14, 1993

Ms. Maureen Colosa  
Community Health Branch  
Division of Health Assessment and Consultation  
Agency for Toxic Substances and Disease Registry  
Mailstop E-32  
1600 Clifton Road, N.E.  
Atlanta, Georgia 30333

Dear Ms. Colosa:

SUBJECT: Petitioned Public Health Assessment, Allen Park Clay  
Mine, Allen Park, Wayne County, Michigan  
MID 980 568 711

Enclosed is the environmental monitoring data which you requested for the Allen Park Clay Mine landfill during our recent conversation regarding the Waste Management Division comments on the draft Public Health Assessment Report. The information includes lysimeter monitoring data for leak detection adjacent to the base of Cell 1, groundwater monitoring data, and surface water monitoring data for both the hazardous and nonhazardous waste operations at the facility. Also included with the data are drawings showing the locations of the monitoring points.

If you have any questions regarding the information provided, please contact me.

Sincerely,

Peter Quackenbush  
Senior Environmental Engineer  
Waste Management Division  
517-373-7397

Enclosure

cc: Mr. Richard Traub, U.S. EPA  
Ms. Lorraine Kosik, U.S. EPA  
Ms. De Montgomery, DNR  
HWP/C&E File

711-11



STATE OF MICHIGAN



NATURAL RESOURCES  
COMMISSION

JERRY C. BARTNIK  
LARRY DEVUYST  
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DAVID HOLLI  
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JOHN ENGLER, Governor

DEPARTMENT OF NATURAL RESOURCES

John Hannah Building, P.O. Box 30241, Lansing, MI 48909

ROLAND HARMES, Director

May 13, 1994

Mr. Fred Eaton  
District Field Representative  
The Honorable John D. Dingell's Office  
5465 Schaefer Road  
Dearborn, Michigan 48126

Dear Mr. Eaton:

I enjoyed speaking with you on Thursday, May 5th, at the Ford Allen Park Clay Mine public meeting conducted by the United States Environmental Protection Agency (U.S. EPA) regarding the proposed disposal of Polychlorinated Biphenyl Wastes (PCB).

As we discussed, enclosed is a copy of the draft Federal Toxic Substance Control Act (TSCA) permit prepared by the U.S. EPA Region 5 staff that was the subject of the public meeting. The Michigan Department of Natural Resources's (MDNR), Waste Management Division (WMD), will be providing written comments on this draft license during the public comment period.

For your information, I have also enclosed a copy of the Hazardous Waste Facility Operating License that was issued to the Ford Allen Park Clay Mine under the authority of Michigan's Hazardous Waste Management Act, 1979 PA 64 as amended. Although the expiration date is May 8, 1994, please be aware that this license remains in effect until MDNR issues its renewal.

The MDNR's review of the draft TSCA permit will focus on any provisions that may adversely affect the design or operation of the facility as a currently licensed hazardous waste management facility. If there are any such provisions in the draft PCB disposal license, we will identify them to the U.S. EPA staff in our written comments. We will provide your office with a copy of our comments as well.

711-B

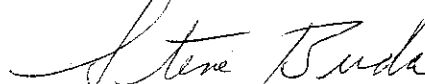
Mr. Fred Eaton

-2-

May 13, 1994

Thank you for your interest. If you have any questions regarding MDNR's hazardous waste facility license, please contact me.

Sincerely,

A handwritten signature in cursive script, appearing to read "Steve Buda".

Steve Buda, P.E., Chief  
Hazardous Waste Permits Unit  
Waste Management Division  
517-373-7924

Enclosures

cc: ✓ Mr. Rich Traub, U.S. EPA  
Mr. Jim Sygo, MDNR  
Mr. Ken Burda, MDNR  
Mr. Pete Quackenbush, MDNR

NATURAL RESOURCES  
COMMISSION

JERRY C. BARTNIK  
LARRY DEVUYST  
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STATE OF MICHIGAN



JOHN ENGLER, Governor

DEPARTMENT OF NATURAL RESOURCES

John Hannah Building, P.O. Box 30241, Lansing, MI 48909

ROLAND HARMES, Director

January 6, 1994

Mr. Jerome Amber, P.E.  
Manager, Wastes and Hazardous Substances  
Ford Motor Company  
15201 Century Drive, Suite 608  
Dearborn, Michigan 48120

Dear Mr. Amber:

SUBJECT: Cell II Construction Certification,  
Ford Allen Park Clay Mine, MID 980 568 711

The Waste Management Division has reviewed the construction certification documents for Cell II dated June 16, 1993, and December 16, 1993. These documents satisfactorily demonstrate that the cell was constructed in accordance with the approved design plans and the construction quality assurance plans contained in the operating license for the Ford Allen Park Clay Mine, issued pursuant to 1979 PA 64, as amended, the Hazardous Waste Management Act. The construction certification for Cell II is hereby approved.

If you have any questions, please contact Mr. Peter Quackenbush at Waste Management Division, Department of Natural Resources, P.O. Box 30241, Lansing, Michigan 48909, or at telephone number 517-373-7397.

Sincerely,

A handwritten signature in black ink, appearing to read "Jim Sygo".

Jim Sygo, Chief  
Waste Management Division  
517-373-9523

cc: Mr. Richard Traub, U.S. EPA  
Ms. Lorraine Kosik, U.S. EPA  
Dr. Ben Okwumabua, DNR-Livonia  
Mr. Ken Burda, DNR/Operating License File  
Mr. Peter Quackenbush, DNR  
Mr. Tarik Namour, DNR

711-12



# Public Health Assessment for

PETITIONED PUBLIC HEALTH ASSESSMENT  
ALLEN PARK CLAY MINE  
ALLEN PARK, WAYNE COUNTY, MICHIGAN  
CERCLIS NO. MID980568711  
MARCH 16, 1994

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
PUBLIC HEALTH SERVICE  
Agency for Toxic Substances and Disease Registry



70-17

PETITIONED PUBLIC HEALTH ASSESSMENT

ALLEN PARK CLAY MINE

ALLEN PARK, WAYNE COUNTY, MICHIGAN

CERCLIS NO. MID980568711

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
PUBLIC HEALTH SERVICE  
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY  
DIVISION OF HEALTH ASSESSMENT AND CONSULTATION  
ATLANTA, GEORGIA

## THE ATSDR PUBLIC HEALTH ASSESSMENT: A NOTE OF EXPLANATION

This Public Health Assessment was prepared by ATSDR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) section 104 (i)(6) (42 U.S.C. 9604 (i)(6)), and in accordance with our implementing regulations 42 C.F.R. Part 90). In preparing this document ATSDR has collected relevant health data, environmental data, and community health concerns from the Environmental Protection Agency (EPA), state and local health and environmental agencies, the community, and potentially responsible parties, where appropriate.

In addition, this document has previously been provided to EPA and the affected states in an initial release, as required by CERCLA section 104 (i)(6)(H) for their information and review. The revised document was released for a 30 day public comment period. Subsequent to the public comment period, ATSDR addressed all public comments and revised or appended the document as appropriate. The public health assessment has now been reissued. This concludes the public health assessment process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

Agency for Toxic Substances and Disease Registry.....David Satcher, M.D., Ph.D., Administrator  
Barry L. Johnson, Ph.D., Assistant Administrator

Division of Health Assessment and Disease Registry.....Robert C. Williams, P.E., DEE, Director  
Juan J. Reyes, Deputy Director

Federal Programs Branch.....Sally L. Shaver, Chief

Community Health Branch.....Cynthia M. Harris, Ph.D., Chief

Remedial Programs Branch.....Sharon Williams-Fleetwood, Ph.D., Chief

Records & Information Management Branch.....Max M. Howie, Jr., Chief

Emergency Response & Consultation Branch.....C. Harold Emmett, P.E., Chief

Use of trade names is for identification only and does not constitute endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

## *ATSDR and its Public Health Assessment*

ATSDR is the Agency for Toxic Substances and Disease Registry, a federal public health agency. ATSDR is part of the Public Health Service in the U.S. Department of Health and Human Services. ATSDR is not a regulatory agency. Created by Superfund legislation in 1980, ATSDR's mission is to prevent or mitigate adverse human health effects and diminished quality of life resulting from exposure to hazardous substances in the environment.

The Superfund legislation directs ATSDR to undertake actions related to public health. One of these actions is to prepare public health assessments for all sites on or proposed for the Environmental Protection Agency's National Priorities List, including sites owned or operated by the federal government.

During ATSDR assessment process the author reviews available information on

- the levels (or concentrations) of the contaminants,
- how people are or might be exposed to the contaminants, and
- how exposure to the contaminants might affect people's health

to decide whether working or living nearby might affect peoples' health, and whether there are physical dangers to people, such as abandoned mine shafts, unsafe buildings, or other hazards.

Four types of information are used in an ATSDR assessment.

- 1) environmental data; information on the contaminants and how people could come in contact with them
- 2) demographic data; information on the ethnicity, socioeconomic status, age, and gender of people living around the site,
- 3) community health concerns; reports from the public about how the site affects their health or quality of life
- 4) health data; information on community-wide rates of illness, disease, and death compared with national and state rates

The sources of this information include the Environmental Protection Agency (EPA) and other federal agencies, state, and local environmental and health agencies, other institutions, organizations, or individuals, and people living around and working at the site and their representatives.

ATSDR health assessors visit the site to see what it is like, how it is used, whether people can walk onto the site, and who lives around the site. Throughout the assessment process, ATSDR health assessors meet with people working at and living around the site to discuss with them their health concerns or symptoms.

A team of ATSDR staff recommend actions based on the information available that will protect the health of the people living around the site. When actions are recommended, ATSDR works with other federal and state agencies to carry out those actions.

A public health action plan is part of the assessment. This plan describes the actions ATSDR and others will take at and around the site to prevent or stop exposure to site contaminants that could harm peoples' health. ATSDR may recommend public health actions that include these:

- restricting access to the site,
- monitoring,
- surveillance, registries, or health studies,
- environmental health education, and
- applied substance-specific research.

ATSDR shares its initial release of the assessment with EPA, other federal departments and agencies, and the state health department to ensure that it is clear, complete, and accurate. After addressing the comments on that release, ATSDR releases the assessment to the general public. ATSDR notifies the public through the media that the assessment is available at nearby libraries, the city hall, or another convenient place. Based on comments from the public, ATSDR may revise the assessment. ATSDR then releases the final assessment. That release includes in an appendix ATSDR's written response to the public's comments.

If conditions change at the site, or if new information or data become available after the assessment is completed, ATSDR will review the new information and determine what, if any, other public health action is needed.

For more information about ATSDR's assessment process and related programs please write to:

Director  
Division of Health Assessment and Consultation  
Agency for Toxic Substances and Disease Registry  
1600 Clifton Road (E-32)  
Atlanta, Georgia 30333

ALLEN PARK CLAY MINE

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## ALLEN PARK CLAY MINE

### SUMMARY

The Allen Park Clay Mine (APCM) landfill is in Wayne County, Michigan, within the city limits of Allen Park. The APCM site is owned and operated by the Ford Motor Company. The site is bordered on the south by Allen Park, on the east by Melvindale, and on the west by the Snow Woods area of the City of Dearborn. Those residential areas are separated from the APCM site by 6- to 8-lane highways. The Ford Motor Company Manufacturing Complex lies a quarter mile to the north of the site.

The Ford Motor Company developed a clay mine on the site before 1956. Since 1956, the clay excavations have been backfilled with wastes from the Ford Motor Company Rouge River Plant. Some of the wastes (i.e., electric arc furnace dust and decanter tank tar sludge) are classified by the U.S. Environmental Protection Agency as hazardous. Beginning in November 1980, those hazardous wastes were separately deposited at the site in a designated hazardous waste management area called Cell I. In 1986, Cell I was closed, the leachate collection system was expanded, and clay cap was installed. State and federal permits for operation of a hazardous waste disposal cell (Cell II) became effective in June 1989. The cell is expected to begin receiving wastes in 1994.

Area residents have expressed a variety of concerns about the APCM facility. They worry that wastes disposed of at the site might cause illness, particularly cancer, in their community. Concerns have also been raised that dusts generated by site activities might cause illness, and that existing illnesses might become worse as a result of the site. Because of those concerns, two petitions to conduct a public health assessment of the Allen Park Clay Mine site were submitted to the Agency for Toxic Substances and Disease Registry (ATSDR).

Contaminants, including metals and polycyclic aromatic hydrocarbons (PAHs), have been identified in on-site groundwater, storm water runoff, and sediments. ATSDR could not determine if these contaminants were released from the APCM site. Metals have also been found in on-site air. No completed exposure pathways (ways for contaminants to reach the public) have been identified; however, potential exposure pathways do exist. Residents living near the site could be exposed to contaminants in the air. In the past, children playing in the Allen and Tyre storm water drains which run through the community of Melvindale also could have been exposed to contaminants in storm water runoff and sediments. Contaminants found in on-site storm water runoff and sediments, however, have not been at levels likely to cause illness and disease through intermittent exposure. The Allen and Tyre drains are now enclosed in pipe under the ground in off-site residential areas. Contact with contaminants in the leachate was also possible

## ALLEN PARK CLAY MINE

through the Allen and Tyre drains. Installation of leachate collection systems has eliminated that exposure pathway. Finally, although there are contaminants at levels of health concern in groundwater, no uses of that groundwater have been identified.

Residents expressed concerns that the communities surrounding the site may have a high rate of cancer. Health outcome data for the nearby areas indicate that, from 1973 to 1990, there has been an excess occurrence of brain cancer in the Snow Woods community of Dearborn. However, that increase in cancer occurrence could not be attributed to human exposures to contaminants from the site.

From available information, ATSDR has concluded that the APCM site is an indeterminate public health hazard. There is no evidence that people have been exposed to hazardous substances at concentrations likely to cause adverse health effects. However, ATSDR has identified data gaps that limit ATSDR's ability to fully evaluate the site. According to the facility's operating license, air monitoring will be conducted when the new hazardous waste disposal cell begins receiving waste. ATSDR recommends review of this air data to ensure that particulate and contaminant concentrations are at levels that will not endanger public health. ATSDR also recommends that off-site groundwater be monitored, or steps be taken to ensure that the groundwater is not used in the future unless treated.

ATSDR's Health Activities Recommendation Panel (HARP) has reviewed the APCM site to determine if any follow-up health activities are indicated. Because of the elevation of brain cancer incidence rates, the panel determined that a community health investigation and health statistics review is indicated. The Michigan Department of Public Health (MDPH), through an amendment to its cooperative agreement with ATSDR, will conduct data collection and analysis on the most currently available listing of brain cancer cases identified in the communities surrounding the Allen Park Clay Mine during the period of 1973 to the present. The data collection and analysis will include selected census tracts in the cities of Dearborn (those comprising the Snow Woods neighborhood), Melvindale, Allen Park and Dearborn Heights. The findings will be reported in an addendum to this Public Health Assessment. ATSDR will also evaluate any new data or information it receives about this site to determine if additional public health actions are appropriate.

## ALLEN PARK CLAY MINE

### BACKGROUND

#### A. Site Description and History

The Allen Park Clay Mine (APCM) site covers 243 acres, approximately 8 miles southwest of downtown Detroit, at 17005 Oakwood Boulevard, Allen Park, Wayne County, Michigan. The location of the site is shown in Figure 1 (all figures are in Appendix A). The landfill is bordered on the south by Allen Park, on the east by Melvindale, and on the west by the Snow Woods area of the City of Dearborn. Although the site is bordered by residential areas on all but the northern side, it is separated from the residential areas by 6- to 8-lane highways. The Ford Motor Company Manufacturing Complex is in the industrial area bordering the northern part of the site. The Rouge River lies about 1 mile north of the APCM site.

The APCM site consists of 17 acres of hazardous waste landfill (Cell I and Cell II) and 149 acres of a solid waste landfill (called the old landfill unit) that received wastes before the Resource Conservation and Recovery Act (RCRA) was enacted. The site also includes 9 acres of nonhazardous solid waste landfill (Cell III), which received wastes from 1985 to 1989; 25 acres of nonhazardous waste landfill (Cell IV), which was granted a Michigan Act 641 solid waste disposal license in April 1992 and is now accepting non-hazardous solid waste; 33 acres of buffer zone between off-site areas and the landfill, and 27 acres used as easements (1,2).

The APCM site was originally mined for clay to be used in the cement industry. Since 1956, the clay excavations have been backfilled by wastes generated at the nearby Ford Rouge River Plant. A small part of the wastes (i.e., electric arc furnace dust and decanter tank tar sludge) are classified by the U.S. Environmental Protection Agency (EPA) as hazardous. After 1980, in accordance with RCRA legislation, hazardous wastes (including electric arc furnace dust and coke tar sludge) were segregated and separately deposited in a designated hazardous waste management area (Cell I) (3).

Hazardous wastes continued to be disposed of in Cell I until 1985. That cell, which consisted of an 8-acre excavation extending to a depth of 35 feet below grade, was closed in 1986. Closing of Cell I included the following: 1) expansion of a leachate collection system; 2) coverage (capping) with a synthetic liner and clay; 3) installation of a drainage layer in the cap; and 4) grading and planting of a vegetation cover over the capped area (3).

## ALLEN PARK CLAY MINE

A number of improvements have been made at the APCM site. In 1980, projects were initiated to control leachate migration and surface water run-on and runoff. Those projects included installing a system of french drains and a surface water drainage system around the site's perimeter, a perimeter dike system, an interior dike system, and monitoring wells. Those site improvement projects were completed by 1982 (3).

Additional site improvements were made in 1987, including installation of a leachate collection system in the old landfill unit, which had received waste between 1956 and 1985. That was necessary because of buildup of leachate within the landfill. The new collection system discharges leachate into the sanitary sewer (3).

Disposal activities at the APCM site were at first regulated in accordance with a permit issued by Ecorse Township in 1956. Since that time, waste disposal activities at the APCM site have been regulated by the State of Michigan through its hazardous waste disposal legislation -- the Michigan Public Act 87 (1965), as amended by Act 89 in 1971, and by Act 641 in 1979. The facility operated under interim status until a Michigan Public Act 64 license and a Federal HSWA permit became effective in June 1989; a Resource Conservation and Recovery Act (RCRA) permit became effective in June 1989 (3). That permit approved operation of a hazardous waste disposal cell (Cell II). Construction of Cell II is now complete and the cell is expected to begin receiving wastes in 1994.

Residents living near the APCM site expressed concerns to their local officials about health hazards potentially associated with the site. Because of those community concerns, two petitions for a public health assessment of the site were submitted to ATSDR. The first was submitted on December 21, 1988, by the Mayor of Melvindale, Michigan; the second petition was submitted on January 5, 1989, by the City Council of Dearborn, Michigan.

### B. Site Visits

On May 25, 1989, the Agency for Toxic Substances and Disease Registry (ATSDR) staff conducted a site visit at APCM. During the visit, observations were made about on- and off-site conditions, including land use in areas on site and adjacent to the site; the ease of site access; the proximity of residential areas; the presence of on-site physical hazards; and the general physical characteristics of on- and off-site areas.

Access to the site is restricted by an 8-foot, chain link fence surrounding the site. Site access is also somewhat restricted by the 6- to 8-lane highways surrounding

## ALLEN PARK CLAY MINE

the site on the western, southern, and eastern sides. The northern side of the site is bordered by a 3-lane road. Security at the site is maintained by Ford security personnel, who are on call 24 hours a day. On-site security is maintained during periods of active landfill operations.

Inactive parts of the site, particularly the closed and capped hazardous waste area (Cell I), are covered with vegetation, primarily grasses. Ongoing soil excavation and other construction activities are taking place on non-vegetated parts of the site.

On February 11, 1991, ATSDR staff made a second visit to the Allen Park Clay Mine site to obtain additional information about the site conditions and operations. ATSDR staff also held a public availability session about the Allen Park Clay Mine site at the City Hall of Dearborn, Michigan. Representatives from the Michigan Department of Public Health (MDPH) and the Michigan Department of Natural Resources (MDNR) assisted ATSDR in conducting the session. The public availability session provided an opportunity for ATSDR staff to meet with members of the local community in order to discuss ATSDR plans for a public health assessment of the site, and to obtain information on community health concerns related to the site. Information about community health concerns is provided in the Community Health Concerns section of this public health assessment.

### C. Demographics, Land Use, and Natural Resource Use

#### Demographics

The Allen Park Clay Mine site is in the Detroit metropolitan area, approximately 8 miles southwest of downtown Detroit. The site is in a northern section of the City of Allen Park and borders Dearborn to the northwest and Melvindale to the southeast. Population and housing data for the census tract containing the site and for surrounding census tracts (which comprise parts of the cities of Allen Park, Dearborn, and Melvindale) are found in Tables 1 and 2 (all tables are in Appendix B).

Residential areas are in the census tract that contains Allen Park Clay Mine. Those residential areas are southwest of the site. The 1990 population of the tract was 2,270; nearly 91% of the population was white. Only 8.6% were under age 10; 20.6% were age 65 or older. Those figures suggest the presence of large numbers of retirees, possibly including some long-term-care patients at the Veterans Administration Hospital in Dearborn. There were a total of 827 households in this tract (average of 2.74 persons per household). Nearly 75% of

## ALLEN PARK CLAY MINE

housing units were owner occupied; that relatively high percentage indicates a nontransient population.

One of the petitioners for the public health assessment was the Mayor of Melvindale. Melvindale had a 1990 population of 11,235, which was a decline of 8.8% from the 1980 population of more than 12,300. In 1990, approximately 93.6% of Melvindale residents were white. Thirteen percent of the population were under age 10; 14.1% were age 65 or older. Approximately two thirds of occupied housing units in Melvindale were owner occupied, again indicating a nontransient population. The 1990 median value of owner-occupied housing units was approximately \$38,000; median monthly rent paid by renters was \$342; those figures are extremely low, particularly for a community in a major metropolitan area.

A census tract south of the site contains part of the City of Allen Park. That tract had a 1990 population of 6,709; 98% were white. More than 20 percent were age 65 or older. Nearly 90 percent of households were owner occupied; the median value of owner occupied units was just under \$57,000.

Two census tracts that are part of the City of Dearborn are west of the site. Those tracts had a total 1990 population of 6,215. As in the other areas, nearly all residents were white. More than 20% were age 65 or older. More than 94% of the 2,459 households were owner occupied. Median value of homes was approximately \$75,000.

### Land Use

Institutional land use near the site includes the Veterans Administration Hospital immediately southwest of the site and a number of elementary and secondary schools within 1 mile of the site (5).

Except for home gardens, there is no agricultural land use within 1 mile of the site. Recreational land use in the site vicinity includes the Rouge River Park, which is about one-half mile to the north (5).

Located near the APCM site are numerous industrial facilities, including the Ford Motor Company Rouge Manufacturing Complex about a quarter mile north of the site. Other industrial areas are within 1 mile northwest, south, and east of the site. An especially large industrial area of more than 500 acres is 1.25 miles northeast of the site.

## **ALLEN PARK CLAY MINE**

### **Natural Resources**

Two groundwater zones, called shallow and deep, are in the site vicinity. The uppermost part of the shallow groundwater zone generally lies within 10 feet of the ground surface. The deep groundwater zone is approximately 70 feet below the ground surface in the site area. Groundwater from the deep groundwater zone is highly mineralized. According to staff from the Wayne County Department of Public Health and the Michigan Department of Natural Resources, there are no known water wells within 1 mile of the site. Water for residences and commercial users in the site vicinity is provided by the City of Detroit (5,6,7).

The subsurface soil profile at the APCM site consists of upper sands from 3 to 7 feet thick, replaced by fill in some areas. That layer is underlain by a silty clay layer from 65 to 70 feet thick; it in turn overlies the lower sand layer, which ranges in thickness from 3 to 6 feet or more. Groundwater in the lower sands is under artesian pressure, with piezometric levels at or above the ground surface. Those conditions indicate a confined aquifer with an upward hydraulic flow gradient. In other words, the groundwater attempts to flow from the lower sand upward through the clay deposit to the upper sand (5,6).

Storm water runoff from the APCM site enters the Allen and Tyre storm water drains. These drains originate on site and then exit to the east. They run through residential areas of Melvindale before combining into one drain (called Allen drain) which discharges into the Rouge River. The Allen and Tyre Drains are now enclosed in pipe under the ground surface in off-site residential areas. The Rouge River lies about one mile north of the APCM site.

### **D. Health Outcome Data**

Using local and state health databases, it may be possible to determine whether certain health effects are higher than expected in the APCM area. This section identifies the relevant, available databases; they are evaluated in the Public Health Implications section of this public health assessment.

Two surveys were conducted in 1989 and 1990 by residents of the Snow Woods community. Those surveys included self-reporting of health problems.

ATSDR searched for data pertaining to mortality (death) and respiratory diseases surrounding the site. Mortality data are not complete because the population estimates for the minor civil divisions in Wayne County that match the death records are not available. Respiratory disease data in communities surrounding the site do not appear to exist, even on the county level.

## ALLEN PARK CLAY MINE

Two descriptive studies of cancer incidence (cases of newly diagnosed cancer occurring during a specified period) for communities surrounding the site were completed in 1983 and 1989 by the Michigan Cancer Foundation (MCF), Division of Epidemiology (8,9). Health outcome data used in those analyses were obtained from the Metropolitan Detroit Cancer Surveillance System (MDCSS), a cancer registry sponsored by the Surveillance, Epidemiology and End Results (SEER) Program, National Cancer Institute, U.S. Public Health Service.

As part of this public health assessment, ATSDR analyzed the incidence of brain and liver cancers in communities surrounding the APCM site. The data (new cancer cases first diagnosed between 1973 and 1989) were obtained from the MCF Division of Epidemiology.

A review of the previously described surveys, studies, and analyses is contained in the Public Health Implications section of this public health assessment.

## COMMUNITY HEALTH CONCERNS

ATSDR believes identifying and addressing community health concerns relevant to a particular site are critically important to the public health assessment. This section identifies community concerns associated with the APCM site. ATSDR responds to the concerns in the Public Health Implications section of this document.

Community health concerns related to the Allen Park Clay Mine site were expressed by the petitioners and by area residents who attended a public availability meeting for the site in February 1991. In addition, community health concerns were collected from state and local authorities. Community health concerns are summarized as follows:

1. Is the incidence of cancer (including prostate, brain, bladder, colon, and bone cancers, and leukemia) in the Snow Woods, Melvindale, and Allen Park communities higher than in other parts of Michigan?
2. Are the incidences of adverse health outcomes (death, asthma, allergies, emphysema, cirrhosis of the liver, congenital heart defects, and hepatitis) in Snow Woods, Melvindale, and Allen Park higher than in other parts of Michigan?

## ALLEN PARK CLAY MINE

3. How will local residents with preexisting adverse health conditions (such as asthma) be affected by this landfill?
4. Could other industries be contributing to environmental contamination in the area?
5. Could air particulate matter (silt) that regularly accumulates on residential windows and cars in nearby areas be harmful to health?

Local residents have also expressed concerns that clay adhering to the tires of trucks leaving the site was being scattered along Oakwood Boulevard which runs through areas of Allen Park, Dearborn, and Melvindale. In response to those concerns, Ford Motor Company installed an on-site tire wash facility. That action appears to have alleviated the concerns.

Area residents have also expressed concern about the possibility of decreasing property values because of the presence of a landfill in the area. Because that concern is not related to public health, but to economics, ATSDR cannot address it in this public health assessment.

## ENVIRONMENTAL CONTAMINATION AND OTHER HAZARDS

The tables in Appendix B list the contaminants identified in each environmental medium at the site. The contaminants are evaluated in subsequent sections of this public health assessment to determine whether exposure to them has public health significance. ATSDR selects and discusses contaminants using several types of information, including these:

- concentrations on and off site;
- the quality of field and laboratory data and sample design;
- comparison of on- and off-site concentrations to health assessment comparison values for cancer and noncancer endpoints; and
- community health concerns.

Because a contaminant is listed in the tables does not mean it will cause adverse health effects if exposure occurs at specified concentrations. Rather, the list indicates which contaminants will be further evaluated in this public health assessment. The potential for adverse health effects resulting from exposure to contaminants of health concern is discussed in the Public Health Implications section.

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Comparison values used in ATSDR public health assessments are contaminant concentrations in specific media (e.g. air, soil, groundwater) used to select contaminants for further evaluation. ATSDR and other agencies developed those values to provide guidelines for estimating the media concentrations of a contaminant that are unlikely to cause adverse health effects, given a standard daily ingestion rate and standard body weight. See Appendix C for a description of the comparison values used in this public health assessment.

### A. On-Site Contamination

#### Waste Material

Limited information is available to define waste types and concentrations in subsurface waste cells. However, the Michigan Department of Natural Resources (DNR) compiled a summary of waste descriptions for materials disposed of or suspected to have been disposed of in the landfill before 1982 and identified the following sources for those waste materials:

1. fly ash - recovered from waste gases of power stations burning pulverized coal;
2. decanter tank tar sludge - from cooling coke oven gases;
3. coke tar sludge and breeze (fine screening from crushed coke);
4. foundry sand and slag - from iron foundries;
5. basic oxygen furnace dust and kish - generated during steel- and iron-making processes;
6. blast furnace dust and filter cake - recovered from waste gases from iron-making operations;
7. waste water treatment sludge - from steel operations;
8. electric furnace dust; and
9. inorganic material - from glass manufacturing.

Many of those waste materials typically contained inorganic chemicals (e.g., cadmium, chromium, and lead) and organic compounds (e.g., naphthalene) (3).

The following subsections summarize data compiled by Ford Motor Company and submitted in the *RCRA Facility Investigation Phase I Environmental Monitoring Report, Allen Park Clay Mine Landfill* (3).

#### Leachate

Results of leachate samples taken in 1984 and 1985 from the landfill areas (Table 3) show the presence of cadmium, chromium, lead, and naphthalene, a

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noncarcinogenic polycyclic aromatic hydrocarbon (PAH). The leachate is currently discharged to the municipal sanitary sewer system. A clay dike on the perimeter of the landfill has contained leachate on site since 1982 (3).

#### Surface Water

The APCM site has a perimeter drainage system that empties into two major drains from the site, the Allen Drain northeast of the site, and the Tyre Drain southwest of the site. Both the Allen and Tyre Drains are now enclosed in pipe under the ground surface in off-site residential areas. The site also has a sediment settling pond that collects storm water runoff from the site and discharges into the perimeter drainage system that eventually empties into the Allen and Tyre drains (3). The sediment settling pond controls erosion and minimizes the movement of soils off site.

Surface water samples have been collected from the site drains (Allen and Tyre) and from the treatment pond that discharges into the site perimeter drainage system. Under the Michigan Act 641 operating license for APCM, surface water samples are collected and analyzed on a quarterly basis. Under the Michigan Act 41 operating license for APCM, background surface water sampling is done whenever rainfall exceeds one-half inch during a 24 hour period. Results of sample analyses are shown in Table 4. Levels of carcinogenic and noncarcinogenic PAHs in Tyre drain exceeded comparison values and will be further evaluated. Concentrations of cadmium and lead in the treatment pond exceeded ATSDR's comparison values. The detection limits used to analyze some of the contaminants were above ATSDR's comparison values, as shown in Table 4 (3,10,11).

#### Sediment

Sediment samples were collected from Tyre Drain and from the on-site settling pond that collects surface water runoff from the site (Table 5). Under the Michigan Act 641 operating license for APCM, sediment samples are collected and analyzed semiannually. The levels of cadmium and total chromium in the pond and Tyre Drain did not exceed their respective comparison values. In the settling pond, levels of noncarcinogenic PAHs did not exceed comparison values while levels of carcinogenic PAHs did exceed comparison values. No comparison values were available for lead and zinc (3,10,12).

#### Groundwater

Ford Motor Company has installed groundwater monitoring wells at the APCM site. Sampling of those wells has shown that groundwater contains cadmium, total

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chromium, lead, zinc, and noncarcinogenic PAHs. Monitoring well design and construction practices, as well as corrosion of galvanized steel well casing, are possible sources for the levels of metals detected in these wells. Table 6 shows the maximum concentrations of groundwater contaminants detected and the associated comparison values. All wells cited were identified as downgradient wells in reference 3, except for well 5D, which was identified as upgradient. Levels of cadmium, chromium, zinc, and lead exceeded ATSDR's comparison values and will be further evaluated in the Pathways and/or Public Health Implications sections of this public health assessment (3,5).

### Air

Air monitoring data were collected in 1986 when Cell I was being closed and while soil was being excavated and moved. The air samples were collected using high-volume sampling units; particulate concentrations of lead, cadmium, and chromium were determined using atomic absorption spectrophotometry. The samples were analyzed only for the inorganic contaminants shown in Table 7. Levels of particulates in the samples exceeded comparison values; the chromium detection limit was above ATSDR's comparison value (3).

### B. Off-Site Contamination

Off-site environmental monitoring data for all media (air, soil, surface water, groundwater, sediment) were not available for areas adjacent to the APCM site. Air monitoring, however, has been conducted by the Wayne County Air Pollution Control Division (WCAPCD) at a sampling site in the southeastern portion of Allen Park and at another WCAPCD sampling site in Dearborn. This data, collected on a quarterly basis since 1972, shows a steady decline in carcinogenic PAH's in the air (13).

### C. Quality Assurance and Quality Control (QA/QC)

The conclusions and recommendations made in this public health assessment were arrived at using data developed by the Ford Motor Company and reviewed by EPA and the State of Michigan. When descriptions were provided, the quality assurance and quality control (QA/QC) measures appeared to be consistent with measures normally taken during environmental sampling and analysis. The data are assumed to be accurate within the limits of the QA/QC procedures used.

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### D. Physical and Other Hazards

The APCM site, which continues to operate as a waste disposal facility, requires the use of heavy equipment. On-site earth-moving equipment and on-site soil excavations may pose physical hazards to site trespassers, especially small children. Because access to the site is restricted, the likelihood of human contact with on-site physical hazards is reduced.

### Toxic Chemical Release Inventory

The Toxic Chemical Release Inventory (TRI) is an on-line database, maintained by EPA, containing information (self-reports from chemical manufacturers and other companies throughout the United States) about more than 320 different substances released from facilities into the environment between 1987 and 1990. ATSDR conducted a TRI search for Wayne County, Michigan, and for the Allen Park, Dearborn, Dearborn Heights, and Melvindale communities for the 1987, 1988, 1989, and 1990 reporting years. Environmental releases of cadmium, chromium, lead, and zinc were reported for all four years in Wayne County, as well as in the communities surrounding the Allen Park Clay Mine site. Releases of naphthalene, a noncarcinogenic PAH, were reported during those years in Wayne County, but not in the communities surrounding the site. Releases of carcinogenic PAHs, which are also contaminants of concern at the site, are not reported to TRI. A summary of air releases is shown in Table 8.

## PATHWAYS ANALYSES

To determine whether nearby residents are exposed to contaminants from a particular site, ATSDR evaluates the environmental and human components that lead to human exposure. That pathways analysis considers five elements: (1) sources of contamination, (2) environmental media in which the contaminants may be present or from which contaminants may migrate, (3) points of human exposure, (4) routes of human exposure such as ingestion, inhalation, or dermal absorption, and (5) exposed populations.

ATSDR identifies exposure pathways as completed or potential. For a completed exposure pathway to exist, the five elements must exist, and there must be evidence that people have, are, or could be exposed to a contaminant. A potential pathway exists when at least one of the five elements is missing, but could exist (e.g., people may have been exposed in the past, may now be exposed, or may be exposed in the future). A pathway is eliminated when one of the five elements is

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missing and will never exist. Completed and potential pathways may be eliminated when they are unlikely to exist, or to be significant. All completed, potential, and eliminated exposure pathways at the Allen Park Clay Mine site are shown in Table 9.

### A. Completed Exposure Pathways

No completed pathways were identified; one or more elements of the pathway analysis were missing for each medium evaluated.

### B. Potential Exposure Pathways

There are several potential human exposure pathways at the APCM site. Chemicals were detected in on-site environmental media at levels that may be of public health concern if people have been, are now, or could be exposed to them. There is a potential for human exposure via air. In the past, storm water runoff, sediments in the storm water ditches, and leachate may have been potential exposure pathways. The potential exposure pathways are described in the following paragraphs.

#### Storm Water Runoff

On-site storm water runoff is collected in a drainage system (consisting of perimeter drains and a treatment pond) that discharges to the Allen and Tyre drains. Those drains leave the site under a highway and then run through residential neighborhoods. Both the Allen and Tyre Drains are now enclosed in pipe under the ground surface in off-site residential areas. The two drains merge before discharging to the Rouge River.

On-site contaminants may have entered storm waters and migrated off site through the drainage system. Because no off-site storm water data were available, ATSDR assumed (using a worst-case scenario) that off-site storm waters were as contaminated as on-site storm water prior to installation of a leachate collection system. Using that assumption, a potential exposure pathway existed for children who played in the Allen and Tyre drains before the drains were enclosed in pipe under the ground surface in most off-site areas. Children may have inadvertently ingested or had skin contact with heavy metals and PAHs, however, no information is available on the magnitude, frequency, and duration of exposure. Present and future exposure to contaminants in the Allen and Tyre Drains is now less likely because the drains are now enclosed in pipe under the ground surface in off-site residential areas. In addition, monitoring of on-site surface water is required by the APCM Act 64 and Act 641 operating licenses.

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### Leachate

Leachate from the landfill area was a past (before 1982) potential exposure pathway. Before the leachate collection system was installed and the landfill capped, leachate may have discharged into the Allen and Tyre drains and was mixed with surface water drainage that flowed past residential neighborhoods to the Rouge River. Children who played in the drainage ditches could have been exposed to metals and PAHs through dermal contact and inadvertent ingestion. No information is available on the concentrations of contaminants (no off-site sampling data are available) or the frequency or duration of exposure.

### Sediments

Contaminated surface soils may have washed into the drainage system during storms and migrated off site through the Allen and Tyre drains, which pass through residential neighborhoods to the Rouge River. Using the same hypothesis as with surface water, there was a potential pathway (dermal contact and inadvertent ingestion of carcinogenic PAHs) for children who played in the Allen and Tyre drains. No information is available on the magnitude, frequency, and duration of potential exposures. The Allen and Tyre Drains are now enclosed in pipe under the ground surface in off-site residential areas, making present and future public access to the drains less likely. In addition, monitoring of on-site sediments is required by the APCM Act 64 license.

### Air

The primary mechanism by which contaminants at the site may be released to the air is by generation of fugitive (airborne) dusts from surface soils or from subsurface soils or waste materials during excavation and transport of soil at the site. Dust generation may be enhanced during windy conditions. Once airborne, contaminants may migrate to off-site areas. Prevailing winds in the site vicinity blow from the southwest (Figure 4 - Wind Rose).

Available on-site air sampling data (Table 7) were collected in 1986 during soil excavation associated with the closure of Cell I. Closing operations released contaminated soil particulates into the ambient air; on-site workers may have been exposed by inhalation, dermal contact, and incidental ingestion to air particulates, if proper personnel protective measures were not followed. The sampling data, however, are not likely to be indicative of day-to-day, on-site ambient air contamination. No long-term, on-site ambient air monitoring data are available for evaluation by ATSDR; therefore, the consequences of on-site exposure to contaminated ambient air are unknown. Additional monitoring of on-site ambient

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air during normal activities is needed to determine if contaminated fugitive dusts are a problem for workers not wearing personal protective equipment.

The nearby communities are separated from the APCM site by divided highways. Because no off-site air monitoring data are available for areas adjacent to the site, it is not known if contaminated particulates from on-site activities during 1986 were released in sufficient quantities to affect nearby communities. The potential for exposure of nearby residents to site-related contaminants, however, is mitigated by regular site inspections by MDNR and WCAPCD. In addition, WCAPCD has been monitoring and reviewing ambient air quality data collected at WCAPCD monitoring sites in Allen Park and Dearborn since 1972.

The permit for a new waste cell (on site) specifies that periodic air sampling be conducted while the site is operating. These samples will be collected every third day between June and August and every sixth day between September and May. When available, those analytical data should be reviewed to ensure that air particulate and contaminant concentrations are not at levels that will cause illness or disease.

### C. Eliminated Exposure Pathways

#### Groundwater

On-site groundwater contains heavy metals and PAHs; people who use the water could be exposed to contaminants through dermal contact, inhalation of volatilized contaminants, and ingestion. However, available information does not indicate that human exposure to contaminated groundwater is occurring; municipal water serves the area, and private wells are no longer used. If private wells are no longer used, groundwater is an eliminated exposure pathway.

ATSDR could not determine the source of groundwater contaminants. Hydrogeologic conditions at the APCM facility make it unlikely that wastes from the site could contaminate the groundwater. Those conditions, particularly the upward hydraulic flow gradient and the thickness (25 feet or greater) of the low permeability clay layer underlying the site, make it very difficult for contaminants from the site to travel downward to the deep groundwater zone (5). Monitoring well design and construction practices, as well as corrosion of galvanized steel well casing, are possible sources for the levels of metals detected in the wells.

Because the groundwater contains heavy metals and PAHs, ATSDR attempted to ensure that private wells are not used in the APCM area. The hydrogeologic study of the Allen Park Clay Mine stated that there were no private wells in the vicinity

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of the site (5). ATSDR also contacted Michigan Department of Natural Resources about private well use; there were no reports or records of private wells in the area (7). Wayne County has regulated installation of water supply wells, through a permit system, for nearly 40 years. Well-drilling contractors secure permits prior to installation and subsequently submit Water Well Records (well logs). Wayne County has Water Well Records for five attempts from September 1967 through December 1988 to develop wells within approximately one and one-half mile of this site. All such attempt were abandoned and the certified well driller indicated that each of those efforts resulted in a "dry hole". In addition, the deep groundwater zone is reported to be highly mineralized, rendering the water unsuitable for drinking water or other household use. However, in spite of indications that area well water is not being used, it is conceivable that wells may have been a source of water during earlier developmental periods of the area. Therefore, it is possible that some older private wells still exist.

#### Leachate

Leachate was eliminated as a current or future exposure pathway because it is currently discharged to the sanitary sewer, effectively eliminating the potential for the public to be exposed. The leachate is treated at the municipal waste water treatment plant.

## PUBLIC HEALTH IMPLICATIONS

The following sections (Toxicologic Evaluation, Health Outcome Data Evaluation, and Community Health Concerns Evaluation) discuss the public health implications of the potential human exposure pathways of concern at the APCM site. The toxicologic implications of the contaminants are evaluated by considering the following factors: (1) the types and concentrations of contaminants detected in environmental media at the site; (2) the routes by which people may be exposed to those contaminants; and (3) the duration (how long) and frequency (how often) of potential human exposures to the contaminants.

The health outcome data are evaluated using information on the toxicologic implications to determine, to the extent possible, whether the occurrence of adverse health outcomes and associated community health concerns may be related to human exposures to contaminants.

At the Allen Park Clay Mine (APCM) site, there are no known human exposures; that is, there are no completed human exposure pathways. However, there are

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potential exposure pathways (particularly during excavation and construction) for on-site workers, children, and nearby residents. Exposure routes include inhalation, dermal contact, and incidental ingestion of contaminants.

### A. Toxicologic Evaluation

The evaluation of toxicologic effects involves estimating the amount (or dose) of contaminants that an individual might be exposed to on a daily basis. The estimated exposure dose is then compared to established comparison values or health guidelines. People who are exposed for some crucial length of time to contaminants of concern, at levels above comparison values, are more likely to have an associated illness or disease.

Health-based comparison values are developed for contaminants commonly found at hazardous waste sites (see Appendix C). Examples are the ATSDR minimal risk level (MRL) and the EPA reference dose (RfD). The MRL and RfD are estimates of daily human exposure to a contaminant below which adverse health effects are unlikely. MRLs are usually generated for the ingestion and inhalation routes of exposure, and for acute, intermediate, or chronic lengths of exposure (i.e., exposures less than 14 days, 15 to 365 days, or more than 365 days, respectively). ATSDR explains many of those health guidelines in Toxicological Profiles, which also provide chemical-specific information on health effects, environmental transport, and human exposure. ATSDR Toxicological Profiles were consulted for the toxicological evaluations discussed in the following paragraphs (14,15,16,17,18,19).

### Surface Water and Sediment

Collection systems put in place in 1982 and 1987 discharge leachate runoff to the city sanitary sewer system. However, it is possible that people were exposed in the past to contaminants discharging from the site. Contaminants (i.e., cadmium, chromium, lead, and naphthalene) were detected in on-site storm water and sediment (PAHs, cadmium, chromium, lead, and zinc) during sampling conducted between 1984 and 1989. Levels of those contaminants in leachate runoff and sediment do not exceed comparison values by a substantial margin, except for carcinogenic PAHs in Tyre drain water (Table 4). Restricted access to the site limits exposure to on-site sediment and storm water. Because contact with off-site sediment or water would be limited (and probably inadvertent), the resulting estimates of human exposure are not of public health concern.

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### Air (Particulates)

The most likely pathway by which nearby residents and on-site workers may be exposed to contaminants at the APCM site is air. The primary mechanism by which contaminants could be released to air is generation of fugitive (airborne) dusts from surface or subsurface soils during soil excavation at the site.

In 1986, air monitoring data were collected during the closure of Cell I (Table 7). The maximum total suspended particulate (TSP) levels measured were greater than the EPA primary Ambient Air Quality Standard (AAQS). Air samples were also shown to contain cadmium and lead, but at levels below public health concern. Dust control measures are currently being used on site and should minimize dust generation and the potential for people to be exposed to dust.

The APCM site RCRA facility investigation Phase I environmental monitoring report (3) includes an air monitoring program that calls for quarterly air sampling for TSP, lead, cadmium, and chromium. Additional sampling for hexavalent chromium, nickel, copper, phenols, and cyanide is required when TSP levels exceed 150  $\mu\text{g}/\text{m}^3$ . ATSDR concurs with the required air monitoring program. However, consideration should be given to sampling for PAHs, which have been detected in sediment and surface water on site. Supplementary information on PAHs, is provided in Appendix E.

### Groundwater

Data from sampling of on-site monitoring wells identified metals in both the shallow and deep aquifers (Table 6). The source of those contaminants is not known; however, the concentrations of the contaminants are such that chronic exposure would have serious public health implications. No off-site groundwater monitoring data were available for ATSDR's review; therefore, it is not known if contaminants in off-site groundwater are at levels of public health concern. Either off-site groundwater monitoring should be conducted to ensure that the groundwater is not contaminated at levels which could cause illness or disease, or efforts should be made to ensure that no private well water is used.

### B. Health Outcome Data Evaluation

The evaluation of health outcome data may give a general picture of the health of a community, or it may confirm the presence of excess disease or illness in a community. However, elevated rates of a particular disease may not necessarily be caused by hazardous substances in the environment. Other factors, such as socioeconomic status, occupation, and personal habits, also may influence the

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development of disease. In contrast, even if elevated rates of disease are not found, a contaminant may still have caused illness or disease.

Surveys Conducted By the Community

Residents of the community of Snow Woods conducted two surveys in 1989 and 1990 to collect information on the numbers and types of adverse health effects reported by local residents. The surveys reported different types of cancer and adverse reproductive outcomes. Detailed discussions of the two surveys are included in Appendix D.

ATSDR was provided the health information collected during the two community-conducted surveys. The Agency determined that limitations of the methods and data collected prevented ATSDR from conducting statistical analyses to determine the occurrence of excess adverse health effects. Consequently, ATSDR could not make general conclusions about excess cancers or adverse reproductive outcomes using those surveys.

Although the surveys could not establish definitive answers about excess cancers or adverse reproductive outcomes, they did identify diseases of concern in the community and helped focus ATSDR's efforts in investigating other health outcome data. The surveys and other community health concerns were also considered during the development of recommendations for public health actions and future health investigations.

Cancer Incidence Investigations

Cancer incidence is a community health concern associated with the APCM site. The Michigan Cancer Foundation (MCF) conducted two studies of cancer incidence for the communities surrounding the site. The first study, completed in 1983, evaluated the occurrence of cancer (from 1973 to 1981) in two census tracts that comprise the Snow Woods area of Dearborn. The second study, completed in 1989, was a follow-up to the first. It evaluated cancer incidence (from 1973 to 1986) in several census tracts that comprise the Snow Woods, Allen Park, and Melvindale communities (8,9).

MCF provided ATSDR with both crude (not analyzed) data and the analyzed data summaries from those studies. MCF also provided ATSDR with additional brain cancer incidence data for the years 1987 to 1990 for the same geographic areas included in the previous MCF studies. Table 10 summarizes the brain cancer incidence data from the two MCF studies (1973-1981 and 1973-1986) and the brain cancer cases reported by MCF (1987-1989) for the three communities.

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Table 10 - Summary of Brain and Liver Cancer Cases (1973 to 1989)<sup>a</sup>

Study (Time Period)	Number of Cancer Cases			
	Snow Woods	Melvindale	Allen Park	Dearborn Heights
1983 Study (1973-1981)	12 Brain <sup>b</sup> 3 Liver <sup>b</sup>			
1989 Study (1973-1986)	16 Brain <sup>b</sup> 3 Liver	9 Brain 0 Liver	22 Brain 13 Liver	
1990 Data <sup>c</sup> (1973-1989)	22 Brain 3 Liver	14 Brain 4 Liver	30 Brain 15 Liver	8 Brain 3 Liver
(1973-1978)	7 Brain 2 Liver	1 Brain 1 Liver	11 Brain 5 Liver	4 Brain 3 Liver
(1979-1984)	7 Brain 1 Liver	5 Brain 1 Liver	7 Brain 6 Liver	2 Brain 0 Liver
(1985-1989)	8 Brain 0 Liver	8 Brain 2 Liver	12 Brain 4 Liver	2 Brain 1 Liver

<sup>a</sup> Data obtained from the Michigan Cancer Foundation.

<sup>b</sup> Cancer incidence rates calculated from these cases were reported as statistically significant in the Michigan Cancer Foundation studies (8,9).

<sup>c</sup> Cancer incidence rates were not determined for these cases.

First MCF Cancer Study

In the initial MCF study, all cancer cases diagnosed by place of residence from 1973 to 1981 (with the exception of nonmelanoma skin cancers) were identified by the Michigan Cancer Foundation Cancer Surveillance System (8). Cancer rates of residents of the Snow Woods neighborhood were compared with those of the City of Dearborn, Wayne County, and the tri-county area (Wayne, Oakland, and Macomb counties) to determine whether cancer rates in Snow Woods were higher than the rates for populations with similar demographic characteristics not located near the site. Because the populations of the Snow Woods and Dearborn

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neighborhoods were predominantly white (more than 98%), only cancer incidence rates for the white population segments of the control populations were used for comparison. Comparisons were also made by age and sex.

Of the 31 cancer site groups analyzed, results of the study indicated that the only statistically significant excesses of cancer (those that cannot be explained by chance) consistently found in the Snow Woods population during the 1973 to 1981 study period were brain cancer in both men and women and liver cancer in women. Results of the study did not take into account place of residence, occupational history, smoking, alcohol use, and other risk factors that may be related to cancer incidence.

### Second MCF Cancer Study

The second MCF study, completed in 1989, provided a follow-up to the initial study. It contained additional information on cancer incidence for 1982 through 1986 for residents of the Melvindale and Allen Park communities as well as for residents of the Snow Woods neighborhood (9). Place of residence was determined by census tract and included a total of 10 tracts comprising the communities of Snow Woods, Melvindale, and Allen Park. The comparison communities for the study were the City of Dearborn (excluding the Snow Woods neighborhood) and Wayne County (excluding the three study communities). Comparisons were made using only the white segment of the reference population. Adjustments were made for age and sex differences between the study and comparison populations.

The study compared the two groups with regard to their incidence of 38 different types of cancer. To obtain occupational, smoking, and residential histories, the relatives of the 16 Snow Woods residents with brain cancer were telephoned by MCF and asked to respond to a number of questions.

Results of the study indicated that between 1973 and 1986, 2,519 cancer cases were diagnosed among residents of the three study areas (Snow Woods, Melvindale, and Allen Park). Using the Dearborn comparison population, 2,638 cases were expected (the number of cancer cases that should occur if the three study areas had the same cancer incidence as the City of Dearborn). Therefore, the study area population had 5% fewer cases of cancer than were expected, based on cancer incidence rates for the City of Dearborn. Cancer cases for the study area were 8% lower than the number expected (2,743) based on Wayne County cancer incidence rates.

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From the analysis of 38 cancer types, the only higher-than-expected cancer rate was seen in Snow Woods; residents there experienced 16 cases of brain cancer over the 14-year study period; 6 cases were expected based on incidence rates of the two comparison populations. In order to collect additional information about the 16 brain cancer cases, a telephone survey was conducted by MCF; two surviving individuals and the relatives of 12 persons who died of brain cancer were interviewed. The relatives of two persons who died of brain cancer could not be found. The survey obtained information on place of residence, smoking history, and occupation.

Results of the telephone survey indicated that 9 of the 16 persons with brain cancer had lived near the site for 20 years or more (that duration is significant because cancer usually develops many years after exposure). Of the seven men with brain cancer, all but one smoked; five of the seven had worked in occupations with exposure to automobile engine exhaust for lengths of time ranging from 3 to 42 years. Only one of the five women with brain cancer smoked; among the women, there was no consistent occupational history.

### ATSDR Cancer Evaluation

The cancer incidence data from the two MCF studies indicate that there has been a consistent, higher-than-expected number of cases of brain cancer in the Snow Woods community between 1973 and 1986.

ATSDR requested the most current information on the number of brain and liver cancers in the study communities from 1973 to 1990. Table 11 shows that an excess in brain cancer rates was seen in Snow Woods from 1973 to 1990 (the most recent year for which cancer incidence data are available). Table 11 also shows that liver cancer rates in Allen Park, Snow Woods, and Melvindale are comparable to Wayne County and other surrounding counties (Macomb and Oakland).

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Table 11. Age-adjusted brain and liver cancer incidence rates (per 100,000) near APCM site for the period 1973-1990.

Population	Brain	Liver
Allen Park	5.73	2.88
Snow Woods	14.17*	1.70
Melvindale	6.22	1.70
Wayne County	4.89	2.68
Tri-County (Macomb, Oakland, and Wayne)	5.39	2.40

Source: Michigan Cancer Foundation (Division Of Epidemiology)

\* Significantly higher than comparison communities

Age adjusted: Age adjusted to the 1970 U.S. population standard population to eliminate age differences among the populations before comparison.

The available environmental and human health outcome data for the site indicate that although there is an apparent excess number of brain cancers for the period 1973-1990, the excess could not be attributed to the Allen Park Clay Mine site. Recently, MCF stated that no brain cancer cases have been reported in the Snow Woods for either 1990 or 1991, the two most recent years for which reporting is complete (20). No completed environmental and human exposure pathways were found for the site. Information known about potential pathways does not indicate that the site contaminants are at concentrations that may be related to an excess occurrence of brain cancer. Alternative factors, such as other environmental, lifestyle, and occupational factors, may have contributed to this observed occurrence of excess cancer in the Snow Woods community (general information about the health concerns is discussed in Appendix E).

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C. Community Health Concerns Evaluation

ATSDR has addressed each of the community concerns about health as follows:

1. Is the incidence of cancer (including prostate, brain, bladder, colon, and bone cancers, and leukemia) in the Snow Woods, Melvindale, and Allen Park communities higher than in other parts of Michigan?

Between 1973 and 1986, the cancer incidence in the three areas was similar to the rest of Wayne County except for the elevated brain cancer incidence in Snow Woods. Cancers evaluated by the Michigan Cancer Foundation (MCF) included stomach, colon, rectum, liver, esophagus, small intestine, anus, gallbladder, pancreas, retroperitoneum, nasal cavity, larynx, lung and bronchus, trachea, bones and joints, soft tissues, prostate, testis, breast, cervix, ovary, vulva, kidney, ureter, other urinary system organs, eye, thyroid, melanomas, Hodgkin's disease, non-Hodgkin's lymphomas, leukemia, and ill-defined cancer types. There were 16 cases of brain cancer in Snow Woods over the 14-year study period. No completed human exposure pathways were found for the APCM site, and information known about the potential pathways of concern does not indicate that contaminants are present that may be related to an excess occurrence of brain cancer. Because of the small number of cases and the lack of information on important risk factors for brain cancer (e.g., lifestyle, occupational exposures), there is no explanation for the excess. ATSDR's evaluation showed that only rates of brain cancer in Snow Woods were elevated. To further evaluate the risk of brain cancer in the area, ATSDR's Health Activities Recommendation Panel (HARP) has recommended a community health investigation of brain cancer in communities around the APCM site. ATSDR will collaborate with qualified agencies or institutes during that investigation. More information about brain cancer is provided in Appendix E.

2. Are the incidences of adverse health outcomes (death, asthma, allergies, emphysema, cirrhosis of the liver, congenital heart defects, and hepatitis) in Snow Woods, Melvindale, and Allen Park higher than in other parts of Michigan?

Information on mortality rates (death) and occurrence and treatment of respiratory diseases was not available for the communities around the APCM site and therefore could not be evaluated. From its evaluation of the available environmental data, ATSDR found no contaminants related to the site that may contribute to congenital heart defects, cirrhosis of the liver, or

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hepatitis. Environmental contributions to those diseases are minimal compared with other risk factors, such as infectious diseases, lifestyle, genetic defects, occupational exposure, and alcoholism. Information about health effects related to community concerns is discussed in Appendix E.

**3. How will local residents with preexisting adverse health conditions (such as asthma) be affected by this landfill?**

Under current conditions, the health of local residents is not expected to be affected by the APCM site because of the lack of a completed exposure pathway. However, monitoring of fugitive dust and air contaminants during future operations of the landfill is needed to ensure that air particulate and contaminant concentrations do not reach levels that will endanger public health. Periodic air sampling is required by the permit for a new waste cell on the APCM site and corrective measures are required if air particulate and contaminant concentrations exceed standards in the permit. These actions should prevent local residents with preexisting adverse health conditions from being affected by the landfill.

**4. Could other industries be contributing to environmental contamination in the area?**

A review of the EPA Toxic Release Inventory showed that there are other sources of contamination in the Allen Park, Melvindale, Dearborn, and Dearborn Heights areas. For example, there were more than 200 environmental releases in the city of Dearborn during the three-year period of 1987-1989. The Toxic Release Inventory Section of this document includes additional information about reported industrial releases of contaminants in Wayne County and in the specific communities surrounding the site.

**5. Could air particulate matter (silt) that regularly accumulates on residential windows and cars in nearby areas be harmful to health?**

Particulates can be detrimental to human health. The particulate matter can be toxic or act as a carrier of an absorbed hazardous substance. It can also interfere with the body's ability to clear the respiratory tract.

A maximum air particulate concentration of  $1,089 \mu\text{g}/\text{m}^3$  was detected on site during the closing of landfill Cell I. That concentration exceeded the former National Ambient Air Quality Standard for total suspended particulates; the standard was intended to protect public health. However,

## ALLEN PARK CLAY MINE

it is not known if, or at what concentration, particulates migrated to off-site residential areas.

The permit for the new waste cell (Cell II) specifies that on-site air will be periodically sampled while the cell is operating.

## ALLEN PARK CLAY MINE

### CONCLUSIONS

1. The Allen Park Clay Mine landfill is an indeterminate public health hazard because additional information is needed to evaluate possible air exposure pathways. There may have been air exposure pathways in the past. However, there is no information documenting exposure levels or duration. The permit for a new waste cell at APCM requires periodic air monitoring. This monitoring combined with appropriate control efforts mitigates future public health risk due to exposure to airborne contaminants.
2. Air monitoring data collected in 1986 indicate that concentrations of inorganic metals (cadmium and lead) are below health-based comparison values; however, there are data gaps for organic compounds (polycyclic aromatic hydrocarbons).
3. On-site groundwater monitoring identified metals at levels that could adversely affect human health if groundwater was consumed. However, because there is no indication that groundwater is used for drinking water, the contaminants are not a public health concern.
4. There was a potential exposure pathway for children who played in the Allen and Tyre drains. Both drains are now enclosed underground in off-site residential areas. Levels of contaminants in storm water runoff and sediments off site were assumed to be the same as levels on site. At those levels, intermittent exposure is not of public health concern.
5. Available health outcome data indicate that there was a statistically significant excess occurrence of brain cancer in men and women (from 1973 to 1986) and of liver cancer in women (from 1973 to 1981) in the Snow Woods community of Dearborn. More recent information (1987 to 1990) on the number of brain cancer cases in the Snow Woods community suggests that the excess brain cancer may have persisted throughout the period of 1973 to 1990. However, no brain cancer cases were reported in Snow Woods for either 1990 or 1991.
6. Previous health outcome data indicated that, from 1973 to 1981, there was an excess number of liver cancer cases in the Snow Woods community. More recent data indicate that the cancer incidence is no longer significantly elevated.
7. The available environmental and health outcome data for the site indicate that, although an apparent excess number of brain cancers was observed for the period of 1973-1990, the excess could not be attributed to the APCM site.

## ALLEN PARK CLAY MINE

### RECOMMENDATIONS

#### A. Recommendations and HARP Statement

##### Recommendations

1. The permit for a new waste cell (on site) specifies that periodic air sampling be conducted while the site is operating. The monitoring should include analyses for metals, particulates, and organic contaminants of concern, such as PAHs. When available, those analytical data should be reviewed to ensure that air particulate and contaminant concentrations are at levels that will not endanger public health.
2. Because on-site groundwater is contaminated with elevated levels of metals, efforts should be made to monitor groundwater off site, or to ensure that private well water in the area is not used in the future unless treated.
3. Consider additional follow-up activities if data become available suggesting that people have been or are being exposed to site-related contaminants.

##### HARP Statement

In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended, the Allen Park Clay Mine site, Wayne County, Michigan, has been evaluated by the ATSDR Health Activities Recommendation Panel (HARP) to determine if any appropriate follow-up health activities are indicated at this site. There is no evidence that environmental exposures have occurred at this site. However, because of the elevation of brain cancer incidence rates, the panel determined that conducting a community health investigation and health statistics review is indicated. A community health investigation is a medical or epidemiologic evaluation of descriptive health information about individual persons to evaluate and determine health concerns and to assess the likelihood they may be linked to exposure to hazardous substances. A health statistics review is an evaluation of information and/or relevant health outcome data for an involved population. ATSDR will also evaluate any new data or information it receives about this site to determine if additional public health actions are appropriate.

## ALLEN PARK CLAY MINE

### B. Public Health Action Plan

The purpose of the Public Health Action Plan (PHAP) is to ensure that this public health assessment not only identifies public health hazards but also provides a plan of action designed to mitigate and prevent adverse human health effects resulting from exposure to hazardous substances in the environment.

#### Actions Undertaken

1. ATSDR held a public availability meeting on February 11, 1991, at the City Hall of Dearborn, Michigan, with the assistance of representatives from the state departments of health and natural resources. ATSDR staff discussed community health concerns associated with the Allen Park Clay Mine Landfill.
2. ATSDR has conducted a health statistics review of age-adjusted incidence rates for liver and brain cancer near the APCM site for the period 1973 - 1990. The results of this review are included in the Health Outcome Data Section of this document.
3. The Wayne County Health Department and the Michigan Department of Natural Resources have regularly inspected the APCM landfill to ensure that the facility is in compliance with state and federal permits. In addition, the Wayne County Air Pollution Control Division (WCAPCD) has monitored and reviewed ambient air quality data collected at WCAPCD monitoring sites in Allen Park and Dearborn since 1972.

#### Actions Planned

1. The Michigan Department of Public Health (MDPH) will conduct data collection and analysis on the most currently available listing of brain cancer cases identified in the communities surrounding the Allen Park Clay Mine during the period of 1973 to the present. These activities will include administration of a questionnaire survey pertaining to each documented case of brain cancer, where possible, in the Snow Wood neighborhood and selected census tracts of Melvindale, Allen Park and Dearborn Heights. Geographic Information System (GIS) technology will be utilized in evaluating possible relationships to potential environmental, occupational and behavioral risk factors, including spatial relationships to the site. The findings will be reported in an addendum to this Public Health Assessment.
2. The Michigan Department of Natural Resources is requiring additional on-site air monitoring when the facility begins receiving hazardous waste. This data will be

## ALLEN PARK CLAY MINE

reviewed by the Wayne County Air Pollution Control Division and the Michigan Department of Natural Resources.

3. The Wayne County Health Department and the Michigan Department of Natural Resources will continue to regularly inspect the APCM facility to ensure that the facility is in compliance with state and federal permits. The Wayne County Air Pollution Control Division (WCAPCD) will continue to monitor and review ambient air quality data collected at WCAPCD monitoring sites in Allen Park and Dearborn. In addition, any new groundwater monitoring data available will be reviewed through EPA's Groundwater Information Tracking System (GRITS) to confirm that the health of citizens is not at risk from exposure to groundwater contaminants. GRITS is a comprehensive groundwater database system designed to store, analyze, and report data generated during groundwater monitoring programs at regulated sites.

ATSDR will reevaluate and expand the Public Health Action Plan when needed. New environmental, toxicological, or health outcome data, or the results of implementing the above proposed actions may determine the need for additional actions at this site.

ALLEN PARK CLAY MINE

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## ALLEN PARK CLAY MINE

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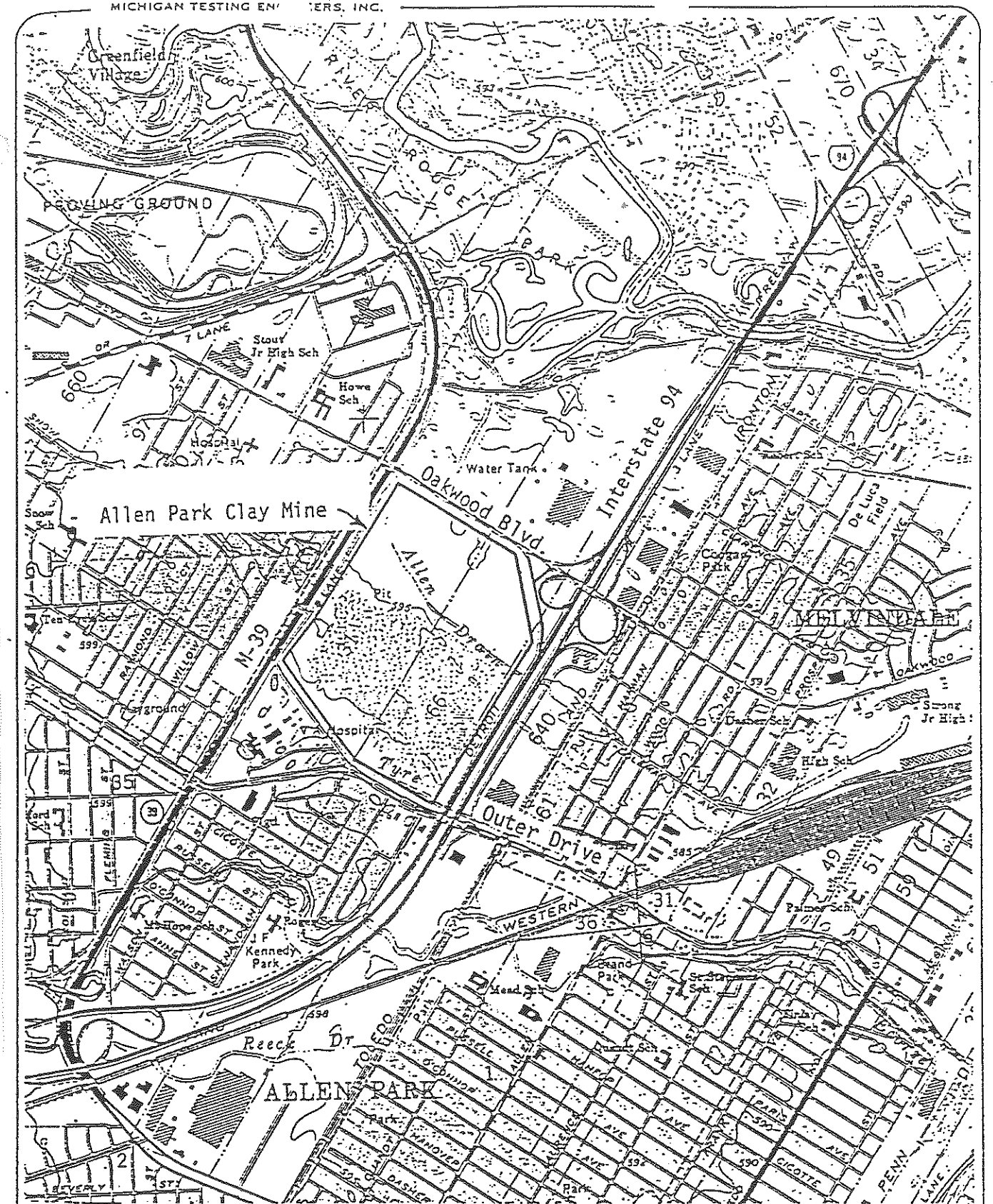
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#### APPENDIX A - FIGURES



0 1000 2000 3000 4000 5000

Scale - Feet  
Contour Interval 5 Feet  
Datum is Mean Sea Level

Allen Park Clay Mine  
Disposal Landfill  
Allen Park, Michigan  
Wayne County

Figure 1  
Area Map

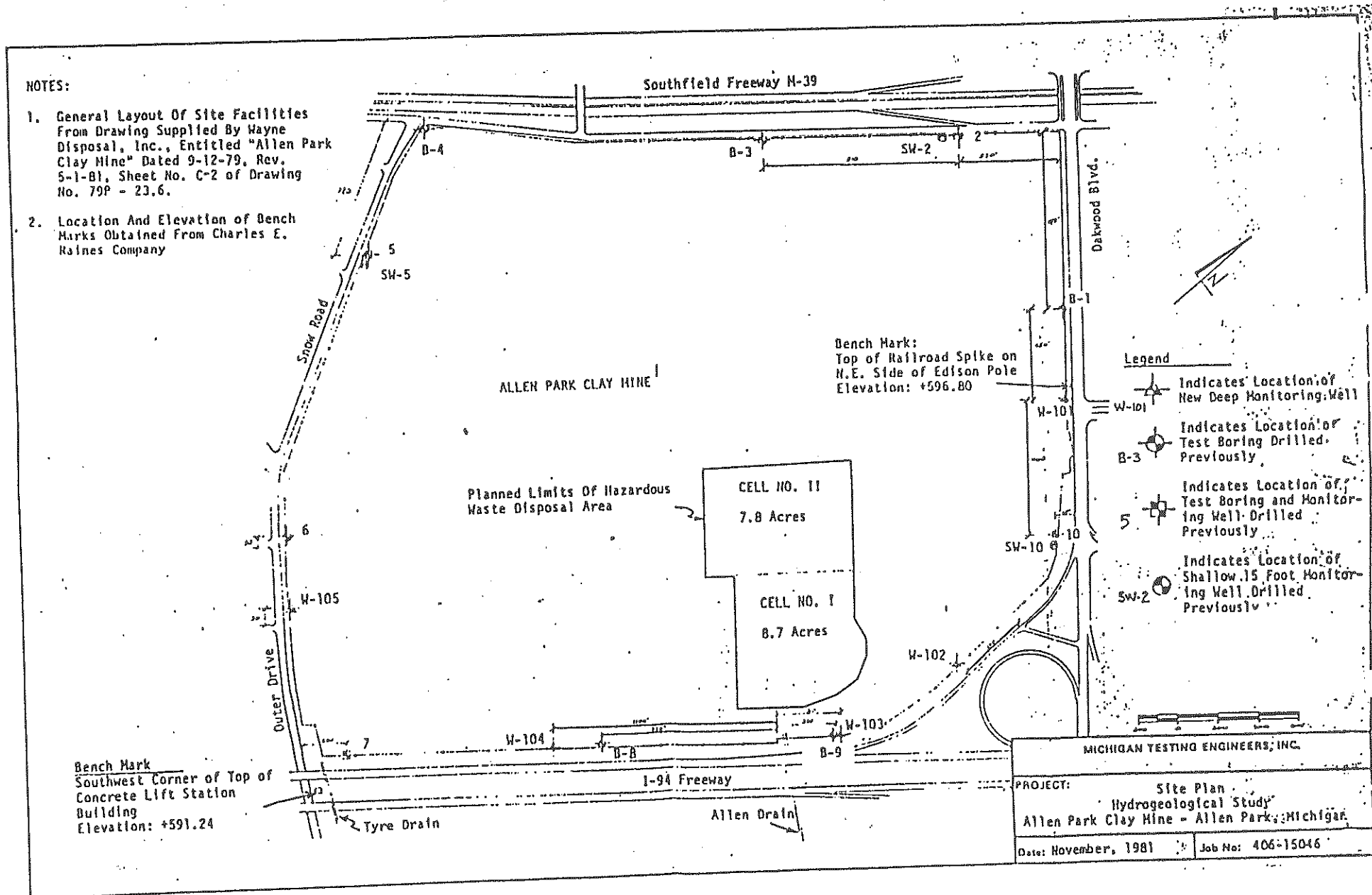


Figure 2  
Site Map

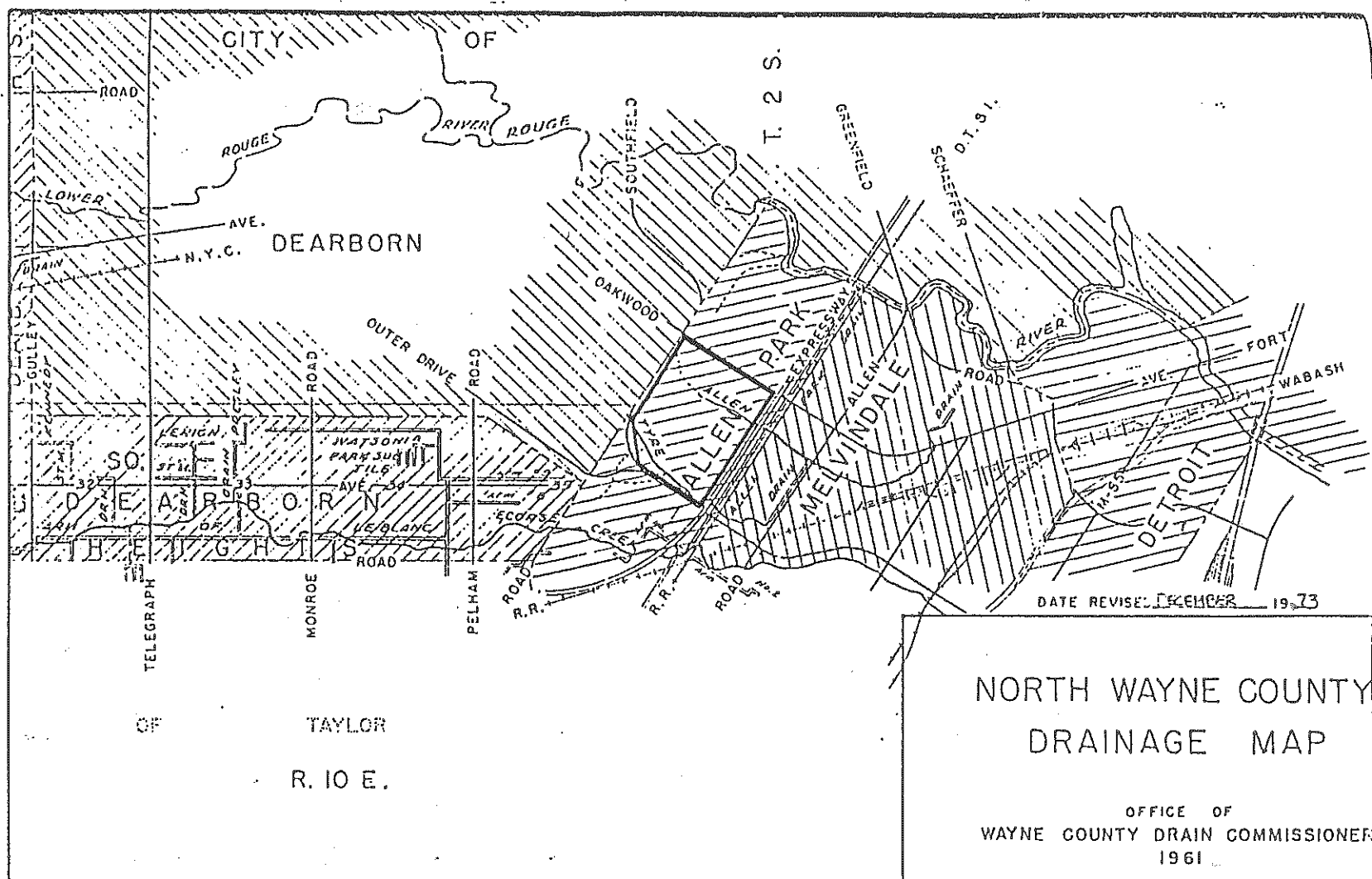
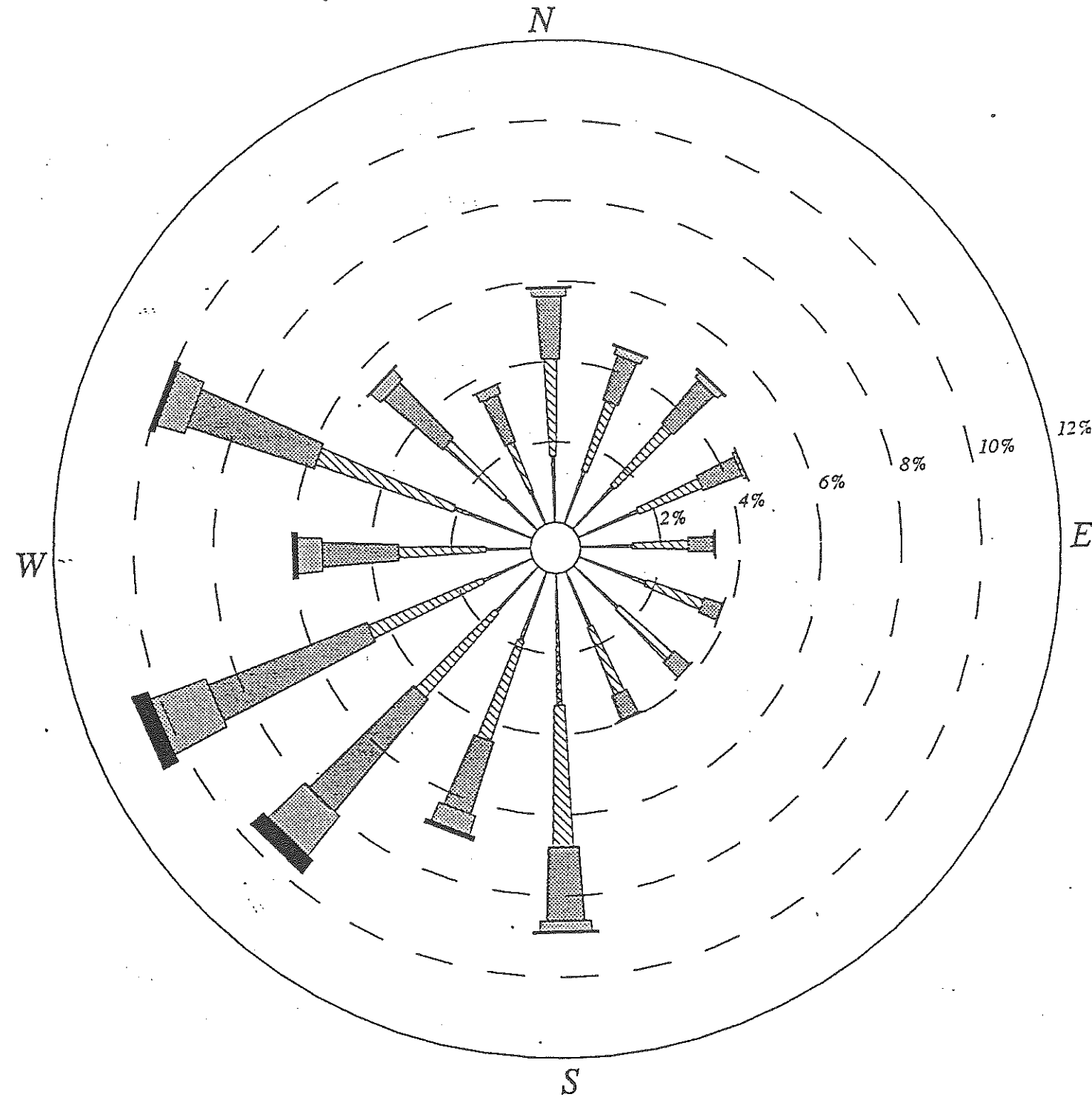


Figure 3  
Storm Water Drainage Map

Allen Park, MI ('84-89)

January 1-December 31; Midnight-11 PM

ALLEN PARK CLAY MINE



CALM WINDS 3.40%

WIND SPEED (KNOTS)

NOTE: Frequencies indicate direction from which the wind is blowing.

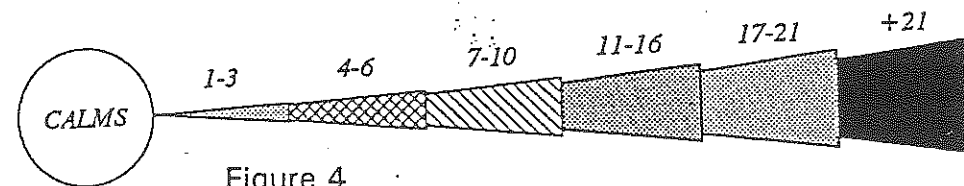


Figure 4  
Wind Rose

APPENDIX B - TABLES

ALLEN PARK CLAY MINE

TABLE 1 - POPULATION DATA

	*Site	@Allen Park	#Melvindale	&Dearborn
Total persons	2,270	6,709	11,235	6,215
Total area, square miles	1.77	1.41	2.79	1.27
Persons per square mile	1,283	4,759	4,027	4,894
% Male	52.8	47.4	48.3	47.7
% Female	47.2	52.6	51.7	52.3
% White	91.0	98.0	93.6	98.7
% Black	5.8	0.0	2.9	0.1
% American Indian, Eskimo, or Aleut	0.2	0.3	1.0	0.2
% Asian or Pacific Islander	2.0	1.0	0.8	0.8
% Other races	1.1	0.7	1.7	0.2
% Hispanic origin	4.8	4.1	5.6	1.8
% Under age 10	8.6	12.4	13.0	11.3
% Age 65 and older	20.6	20.2	14.1	21.0

Source: 1990 Census of Population and Housing, Summary Tape File 1 (Michigan). Prepared by Bureau of the Census, Washington, DC, 1991.

\* Census Tract 5760  
@ Census Tract 5761  
# Census Tracts 5785 and 5786  
& Census Tracts 5755 and 5756

ALLEN PARK CLAY MINE

TABLE 2 - HOUSING DATA

	*Site	@Allen Park	#Melvindale	&Dearborn
Households*	827	2,637	4,677	2,459
Persons per household	2.45	2.53	2.40	2.52
% Households owner-occupied	75.0	87.5	64.0	94.4
% Households renter-occupied	25.0	12.5	36.0	5.6
% Households mobile homes	0.1	0.1	1.0	0.0
Median value, owner-occupied households, \$	70,300	56,800	~37,000	~75,000
Median mo. rent, renter-occupied households, \$	518	742	342	~550

\* A household is an occupied housing unit, but does not include group quarters such as military barracks, prisons, and college dormitories.

Source: 1990 Census of Population and Housing, Summary Tape File 1 (Michigan).  
Prepared by Bureau of the Census, Washington, DC, 1991.

\* Census Tract 5760  
@ Census Tract 5761  
# Census Tracts 5785 and 5786  
& Census Tracts 5755 and 5756

ALLEN PARK CLAY MINE

TABLE 3. CONTAMINANTS IN ON-SITE LEACHATE AT ALLEN PARK

CONTAMINANT	MAXIMUM CONCENTRATION (ppb)	DATE	SOURCE
Cadmium	40	8/84	3
Chromium	340	12/84	3
Lead	485	4/85	3
Zinc	40	7/84	3
Carcinogenic PAHs	NA		3
Noncarcinogenic PAHs	2704	7/84	3

NA = Not analyzed

ALLEN PARK CLAY MINE

TABLE 4. PAST CONTAMINANTS IN ON-SITE STORM WATER/TREATMENT POND AT ALLEN PARK

CONTAMINANT	MAXIMUM CONCENTRATION (ppb)(1)									COMPARISON VALUE	
	ALLEN DRAIN	DATE	SOURCE	TYRE DRAIN	DATE	SOURCE	TREATMENT POND	SOURCE	DATE	VALUE (ppb)	Source <sup>1</sup>
Cadmium	<10	4/93	11	NA		3	20	3	7/84	2	EMEG (child)
Chromium	30	4/84	3	<20	3/85	3	<20	3	5/85	50	Rfd (child)
Lead	<50	4/93	11	<50	3/85	3	40	3	7/84	0	MCLG
Zinc	20	4/93	11	NA		3	NA	3		2100	LTHA
Carcinogenic PAHs	<10	4/93	11	15	7/84	10	<500	3	11/84	.006	CREG <sup>2</sup>
Noncarcinogenic PAHs	<10	4/93	11	69	7/84	10	<500	3	11/84	20	LTHA <sup>3</sup>

<sup>1</sup> See Appendix C for definitions.  
<sup>2</sup> Used comparison value for benzo(a)pyrene  
<sup>3</sup> Used comparison value for naphthalene  
  
NA = Not analyzed  
ND = Not detected

ALLEN PARK CLAY MINE

TABLE 5. CONTAMINANTS IN ON-SITE SEDIMENT

CONTAMINANT	MAXIMUM CONCENTRATION (mg/kg)						COMPARISON VALUE	
	TREATMENT POND	DATE	SOURCE	TYRE DRAIN	DATE	SOURCE	CONCENTRATION (mg/kg)	SOURCE <sup>1</sup>
Cadmium	10	09/90	12	1.6	8/83	3	25	EMEG
Chromium, total	48	04/91	12	1.0	8/83	3	200	EMEG
Lead	45	09/89	12	6.3	8/83	3	none	
Zinc	81	09/90	12	NA		3	none	
Carcinogenic PAHs	.776	12/84	10	NA		3	.12	CREG <sup>2</sup>
Noncarcinogenic PAHs	.820	12/84	10	NA	8/83	3	Est. 2,000	Rfd <sup>3</sup>

<sup>1</sup> See Appendix C for definitions.  
<sup>2</sup> Used comparison value for benzo(a)pyrene  
<sup>3</sup> Estimated comparison value for naphthalene  
  
ND = Not detected  
NA = Not analyzed

TABLE 6. CONTAMINANTS IN ON-SITE GROUNDWATER AT ALLEN PARK\*

CONTAMINANT	MAXIMUM CONCENTRATION (ppb) <sup>1</sup>				COMPARISON VALUE	
	AQUIFERS				CONCENTRATION (ppb)	REFERENCES <sup>1</sup>
	SHALLOW	DATE	DEEP	DATE		
Cadmium	20 <sup>A</sup>	8/81	240 <sup>B</sup>	8/81	2	EMEG (child)
Chromium	50 <sup>A</sup>	5/81	210 <sup>C</sup>	4/84	50	Rfd (child)
Lead	240 <sup>A</sup>	12/88	1000 <sup>D</sup>	3/85	0	MCLG
Zinc	NA		37,000 <sup>E</sup>	12/80	2100	LTHA
Carcinogenic PAHs	NA		NA		.006	CREG <sup>2</sup>
Noncarcinogenic PAHs	< 20 <sup>A</sup>	1/86	18 <sup>F</sup>	11/87	20	LTHA <sup>3</sup>

<sup>1</sup> See Appendix C for definitions.

<sup>2</sup> Used comparison value for benzo(a)pyrene

<sup>3</sup> Used comparison value for naphthalene

NA = Not analyzed

ND = Not detected

<sup>A</sup> Well 2S

<sup>B</sup> Well 2D

<sup>C</sup> Well 102D

<sup>D</sup> Well 7D

<sup>E</sup> Well 10D

<sup>F</sup> Well 5D and 105D

\* All values are from reference 3, except for zinc, which was derived from information in reference 10

\* All wells were identified as downgradient wells in reference 3, except for well 5D, which was identified as upgradient.

TABLE 7. CONTAMINANTS IN ON-SITE AIR<sup>1</sup>

CONTAMINANT	MAXIMUM CONCENTRATION (µg/m³)	DATE OF SAMPLING	COMPARISON VALUE	
			CONCENTRATION (µg/m³)	SOURCE <sup>2</sup>
Cadmium	0.007	8/86	.2	EMEG
Chromium, total	<0.80	8/86	0.000083	CREG
Lead	0.242	9/86	1.5	NAAQS <sup>3</sup>
Particulates (total suspended)	1,089	9/86	260	NAAQS <sup>3</sup>
Zinc	NA		None	
Carcinogenic PAHs	NA		None	
Noncarcinogenic PAHs	NA		None	

An air monitoring station was placed at the eastern edge of the site and adjacent to Interstate 94 between August and November 1986.

<sup>1</sup> All values are from reference 3 and represent air samples collected during construction

<sup>2</sup> See Appendix C for definitions

<sup>3</sup> National Ambient Air Quality Standard

NA = Not analyzed

TABLE 8. SUMMARY OF AIR RELEASES<sup>1</sup> FOR ALLEN PARK, DEARBORN, DEARBORN HEIGHTS, AND MELVINDALE (lbs)

CONTAMINANT	1987	1988	1989	1990
Cadmium	0	0	0	36
Chromium	257	18,024	1	1
Lead	277	851	5	4,349
Zinc	0	250	250	5
Carcinogenic PAHs	NR	NR	NR	NR
Noncarcinogenic PAHs	0	0	0	0

NR - Not Reported  
<sup>1</sup> U.S. Environmental Protection Agency Toxic Chemical Release Inventory

ALLEN PARK CLAY MINE

TABLE 9. EXPOSURE PATHWAYS AT ALLEN PARK CLAY MINE

PATHWAY NAME	EXPOSURE PATHWAY ELEMENTS					TIME
	CONTAMINANTS OF CONCERN	MEDIA	POINT OF EXPOSURE	ROUTE OF EXPOSURE	EXPOSED POPULATION	
POTENTIAL EXPOSURE PATHWAYS						
STORM WATER RUNOFF	Metals, PAHs	Storm water runoff	Storm water drains downgradient of site	Dermal Ingestion	Children playing in storm water drains downgradient of the site.	Past
LEACHATE	Metals, PAHs	Leachate	Direct contact	Dermal Ingestion	Children playing in storm water drains downgradient of site before 1987	Past
SEDIMENTS	Metals, PAHs	Sediments	Direct contact with drain sediment	Dermal Ingestion	Children playing in drains downgradient of the site	Past
AIR	Metals, PAHs	Ambient air	On-site workers Nearby residences	Dermal Ingestion Inhalation	Residents downwind of the site	Past Present Future
ELIMINATED EXPOSURE PATHWAYS						
GROUNDWATER	Metals, PAHs	Groundwater	Wells downgradient of the site	Dermal Inhalation Ingestion	No wells are known to exist within 3 miles of the site	Past Present Future
LEACHATE	Metals, PAHs	Leachate	Direct contact	Dermal Ingestion	Contact with leachate unlikely because leachate discharges to sanitary sewer	Present Future

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APPENDIX C - COMPARISON VALUES

ALLEN PARK CLAY MINE

Comparison Values

Comparison values used in ATSDR public health assessments are contaminant concentrations in specific media used to select contaminants for further evaluation. The values provide guidelines for estimating a dose at which health effects might be observed. When more than one comparison value exists for a contaminant in a particular medium, ATSDR uses the most conservative (lowest) value. Comparison values and units of measure used in the Environmental Contamination and Other Hazards and the Public Health Implications sections of this public health assessment are described in the following paragraphs.

- \* CLHA = Child Longer-Term Health Advisory
- \* CREG = Cancer Risk Evaluation Guide
- \* EMEG = Environmental Media Evaluation Guide
- \* LTHA = Lifetime Health Advisory
- \* MCL = Maximum Contaminant Level
- \* MCLG = Maximum Contaminant Level Goal
- \* MRL = Minimal Risk Level (mg/kg/day)
- \* NAAQS = National Ambient Air Quality Standard
- \* RfD = Reference Dose (mg/kg/day)
  
- \* ppm = milligrams per liter (mg/L water)  
          milligrams per kilogram (mg/kg soil)
- \* ppb = micrograms per liter (µg/L water)  
          micrograms per kilogram (µg/kg soil)
- \* kg = kilogram
- \* mg = milligram
- \* µg = microgram
- \* L = liter

Child Longer-Term Health Advisories (CLHAs) are contaminant concentrations that the Environmental Protection Agency (EPA) believes will protect public health (taking into consideration the availability and economics of water treatment technology) using a child's weight and ingestion rate.

Cancer Risk Evaluation Guides (CREGs) are estimated contaminant concentrations that would be expected to cause no more than one excess cancer in a million persons exposed over a lifetime (70 years). CREGs are calculated from EPA's cancer slope factors.

Environmental Media Evaluation Guides (EMEGs) are media-specific comparison values used to select contaminants of concern at hazardous waste sites. They are calculated using ATSDR minimal risk levels (MRLs) and factor in body weight and ingestion rates.

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Lifetime Health Advisories (LTHAs) are contaminant concentrations that the Environmental Protection Agency (EPA) believes will protect public health (taking into consideration the availability and economics of water treatment technology) over a lifetime (70 years) at an ingestion rate of 2 liters of water per day.

Maximum Contaminant Levels (MCLs) are maximum permissible contaminant concentrations in drinking water that EPA believes will protect public health (considering the availability and economics of water treatment technology) over a lifetime (70 years) at an exposure rate of 2 liters per day (for an adult).

Maximum Contaminant Level Goals (MCLGs) are drinking water health goals set at levels at which no known or anticipated adverse health effect occurs and which allow an adequate margin of safety. Such levels consider the possible impact of synergistic effects, long-term and multi-stage exposures, and the existence of susceptible groups in the population. When there is no safe threshold for a contaminant, the MCLG should be set at zero.

A Minimal Risk Level (MRL) is an estimate of daily human exposure to a chemical (in mg/kg/day) that is likely to be without an appreciable risk of deleterious effects (noncancer) over a specified duration of exposure. MRLs are calculated using data from human and animal studies, and are reported for acute ( $\leq 14$  days), intermediate (15-364 days), and chronic ( $\geq 365$  days) exposures. MRLs for specific chemicals are published in ATSDR Toxicological Profiles.

The National Ambient Air Quality Standards (NAAQS) are established under Section 109 of the Clean Air Act; they apply to any pollutants that, if present in air, might endanger public health. The standards are not enforceable; rather, they establish ceilings that are not to be exceeded in the area in which the contaminant source is located.

EPA's Reference Dose (RfD) is an estimate of the lifetime daily exposure to a contaminant that is unlikely to cause adverse (noncancer) health effects.

### Comparison Value References

1. Agency for Toxic Substances and Disease Registry. Health Assessment Guidance Manual. Atlanta: ATSDR, March 1992.

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### APPENDIX D - SUMMARY OF SURVEYS CONDUCTED BY THE COMMUNITY

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SUMMARY OF SURVEYS CONDUCTED BY THE COMMUNITY

Table 12. Self Reported Study for Snow Woods (Ash and Venice Streets)

Cancer Type	Number of Cases	Number of Deaths
Lung	5	5
Brain	2	2
Lung and Brain	1	1
Throat	1	1
Unspecified	11	8
Adverse Reproductive Outcome	Number of Cases	Number of Deaths
Stillbirth (late fetal death)	1	1
Congenital Heart Defect	1	1
Miscarriages	2	2
Genitourinary Disorders	4	0

Residents of the community near APCM have conducted surveys to collect information on the numbers and types of adverse health effects reported by local residents. One citizen conducted a survey (in 1990) of self-reported cancer and reproductive outcomes among citizens residing near Ash and Venice streets in the Snow Woods area of Dearborn. Twenty local residents of unknown age and race were surveyed; they reported information about cancer occurrence and death from cancer and about selected adverse reproductive outcomes (Table 12).

A second health survey, of the Snow Woods neighborhood of Dearborn, Michigan, was conducted (in 1989) by two local residents. The residents used a neighborhood cancer survey form provided by the Wayne County Health Department, Environmental Protection Bureau, to conduct the survey. The survey form included information on address, years of residence in the neighborhood, occupation, smoking status, sex, cancer diagnosis, and other health complaints. Respondents lived north and south of Snow Woods Road, within the boundaries of the U.S. Postal Service ZIP Code area numbered 48124. Residences included in

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the survey were approximately one-third of the total number of residences in the Snow Woods neighborhood of Dearborn.

A summary of reported cancer occurrence in women and men is provided in Tables 13 and 14. As shown in those tables, the most frequently reported cancers in women were cancers of the breast, colon, and uterine cervix (cervical cancer), particularly in women aged 46 to 65 years. The most frequently reported cancers in men were lung, brain, and colon cancers, particularly in men aged 46 to 65 years. Leukemia was reported in 3 males younger than 15 years.

The survey included information on smoking status at the time of the survey; however, information was not collected on smoking history (past smoking), the duration (how long) and frequency (how often), and the type (e.g., cigarette, cigar). Because smoking may cause or contribute to development of many types of cancer, that information is important in determining whether smoking may have contributed to the reported occurrences of cancer in community residents.

Information on smoking status collected during the survey indicated that approximately 18 of the 35 women (51%) who reported having cancer considered themselves to be smokers or to have been smokers within the 10-year period before their cancers were diagnosed. Among the 10 women who reported breast cancer, 4 (40%) were smokers; among the three women with lung cancer, 1 (33%) was a smoker. Approximately 13 of the 32 men (41%) who reported having cancer were reported to be smokers. Among the 10 men who reported having lung cancer, 6 (60%) were smokers. Available information suggests that smoking may contribute to the occurrence of lung cancer (21).

Occupational information collected during the survey was reviewed to determine whether people who reported having cancer had similar occupations. Occupational exposures to contaminants and other agents have been shown to cause or contribute to the occurrence of various types of cancer. Available information does not reveal any similar trends in occupation for persons who reported having cancer. The data indicate that the majority of women who responded to the survey were homemakers, clerks or office personnel, nurses, and maids. The majority of men who responded were engineers, foremen, or supervisors for General Motors Corporation; teachers or professors; and craftsmen (wood workers, machinists).

Information on the age and number of years in residence in the neighborhood indicates that the majority of respondents were more than 45 years old and had lived in the area 20 to 30 years. That information suggests that the Snow Woods area of Dearborn is a stable (rather than transient) community.

Medical information confirming the reported adverse health outcomes (cancer and adverse reproductive outcomes) was not collected for either of the two

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self-reported surveys. Likewise, information was not available on the completeness and accuracy of information for the reported types of cancer, date of cancer diagnosis, years of residence in the area, smoking status, and occupation. For the first survey, information was not available about the selection of households for the survey, and the age, sex, race, occupation, and smoking status of the respondents.

Table 13. Summary of Citizens' Self-Reported Health Survey (1989)

### Cancer in Men

Cancer Type	Age at Diagnosis (in years) <sup>a</sup>								Total
	<15	15-25	26-35	36-45	46-55	56-65	66-75	>75	
Skin					1	1			2
Colon					2	2			4
Lung					2	4	3	1	10
Leukemia	3				1				4
Brain	1				2	1	1		5
Lymphoma					1	1			2
Kidney							1		1
Larynx							1		1
Pancreas					1		1		2
Liver					1				1
Prostate						1	2		3
Total	4	0	0	0	11	11	8	1	35 <sup>b</sup>

\* Medical information confirming cancer diagnoses was not collected as part of the survey.

<sup>a</sup> The reported age at diagnosis (of each man) was used.

<sup>b</sup> Three men reported two types of cancer; both were included in this table. A total of 32 men reported having cancer.

Table 14. Summary of Citizens' Self-Reported Health Survey (1989)

Cancer in Women

Cancer Type	Age at Diagnosis (in years) <sup>a</sup>								Total
	<15	15-25	26-35	36-45	46-55	56-65	66-75	>75	
Skin				1		1			2
Colon					1	3	1	1	6
Breast				3	2	1	3		9
Thyroid				1					1
Lung					2	1			3
Ovary					2		1		3
Leukemia		1							1
Bone					1				1
Uterine (Cervix)			1		1	3			5
Gallbladder					1				1
Brain					1	1			2
Lymphoma				1	1				2
Stomach						1		1	2
Total		1	1	6	12	11	5	2	38 <sup>b</sup>

<sup>a</sup> The reported age at diagnosis (of each woman) was used.

<sup>b</sup> Three women reported two types of cancer; both were included in this table. A total of 35 women reported having cancer.

Medical information confirming cancer diagnoses was not collected.

APPENDIX E - ADDITIONAL HEALTH INFORMATION

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### Additional Health Information

#### Brain Cancer

Cancers of the brain are characterized as primary or secondary lesions. Primary brain cancers originate within the central nervous system (CNS) and do not usually metastasize (spread) beyond the CNS pathways. Secondary brain cancers originate at distant places in the body and metastasize to the central nervous system. The focus of this public health assessment is on primary brain cancers. The available health outcome (cancer incidence) data pertinent to the site pertain only to primary brain cancers and not to secondary or metastatic brain cancers that originate at biologic sites distant from the brain. Information on the biologic site of origin for metastasized brain cancers is not available for cancer cases at this site; that type of information would be needed to evaluate causes of, or factors contributing to, the occurrence of those types of cancers.

Primary brain cancers occur at varying rates depending on age, sex, and race. The most common type of brain cancer, accounting for more than half of all adult brain cancers, is glioma, a fast-growing cancer in the upper part of the brain. In adults, brain cancers occur most often between the ages of 55 and 79 (21).

A recent report (22) using data from the National Cancer Institute's Surveillance, Epidemiology and End Results (SEER) program documented that national age-specific incidence rates for primary malignant brain tumors (in men and women) increased dramatically between the years 1973-74 and 1985.

The report attributed this observed increase in cancer incidence in older persons to use of improved x-ray techniques for tumor diagnoses since 1973, or to other single or combined genetic, viral, chemical, radiologic, or developmental factors.

Except for meningiomas, a benign tumor of the membranes that surround the brain and spinal cord, men have a higher incidence than women of all types of benign and malignant nervous system tumors. In the United States, brain cancers occur more often in whites than in African-Americans (21).

Brain cancer is the second most common type of cancer in children and occurs most often in children under 10 years. Children have a higher incidence of medulloblastoma, a cancer that affects the part of the brain connected to the spinal cord. It accounts for almost a quarter of all childhood brain cancers, but fewer than 2% of adult brain cancers.

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Few studies indicate causative factors for brain tumors, although toxicologic, epidemiologic and medical data suggest a relationship with occupational, environmental, viral, and genetic factors (21).

Numerous retrospective studies have been conducted to determine possible occupational factors that cause or contribute to the occurrence of primary brain cancers. Collectively, those studies suggest that certain brain cancers are more frequent among workers in specific occupational settings. Specific information on types and duration and frequency of chemical exposures is not available for the majority of those occupational studies.

Among occupations involving potential exposure to chemical carcinogens, it has been suggested that there have been excess brain cancers in workers in rubber-manufacturing plants who are exposed to vinyl chloride (21,23-25); polyvinyl chloride production workers (23,25); farmers, including cattle and sheep ranchers, dairy farmers, and grain millers (21,23,26,27); chemists (21), pharmaceutical workers (21,23); embalmers (21); electricians and persons potentially exposed to electric and magnetic fields (24,25); dentists (25); workers in production of petroleum and petrochemicals (21,23,25); aircraft workers (25); and workers who may be exposed to metal dusts or fumes (24).

Excess mortality from primary brain cancer was reported in retrospective (case-control) studies involving oil refinery workers (28,29) and chemists (30).

Analysis of data from the Swedish Cancer Registry (31) indicates that standardized incidence ratios (rates of occurrence among workers in an industry as compared with rates for similar persons not in the industry) for gliomas were increased among male dentists; agricultural research workers; public prosecutors; female physicians and other health care employees; welders; metal cutters; glass, porcelain, and ceramics workers; and women employed in wool mills.

Long-term exposure of farm workers and of children raised on farms to pesticides has been associated with development of brain cancer. Those studies link childhood brain cancer with exposure to sick pets and farm animals, suggesting a possible viral etiology (21).

There is some clinical evidence that lead exposure may be linked to a type of glioma in children (21). Those findings were supported by studies in which rats fed diets high in lead developed gliomas. A few studies have shown a possible genetic susceptibility to brain cancers. Certain gliomas have been shown to occur more often in families than among people who are not related. There has been shown to be a significant association between brain cancer in children and the presence of epilepsy in their siblings (21).

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Other factors that may be related to the development of primary brain cancer (in particular, meningiomas and gliomas), include high-dose X-rays; consumption of sodium nitrate, a commonly used meat preservative; head trauma (24); use of barbiturates by children and pregnant women (21); exposure to electromagnetic fields (32); and elevated serum cholesterol (33), which may be a marker for elevated socioeconomic status.

### Lung Cancer

Lung cancer is one of the major causes of death in most Western countries, particularly among men. In the United States, lung cancer is the leading cause of death from cancer among men and women, and accounted for approximately 15% of all cancer cases (22% in men, 8% in women) reported in 1980, and for approximately 23% of all cancer deaths (34). Lung cancer has been increasing in most areas of the United States (from 1950 to 1980); the rates have increased most for nonwhite persons and for women aged 20 to 30. An inverse association between lung cancer and socioeconomic status has been observed in several studies (34); that is, the rates of lung cancer are highest in people of lower socioeconomic status. Increased smoking habits among people of lower socioeconomic status may account for that observed difference.

Cigarette smoking is the major cause of lung cancer and is estimated to cause 85% of lung cancer deaths. Tobacco smoke has been shown to interact with some occupational carcinogens, such as asbestos and radon. The risk of developing lung cancer is related to the type of tobacco product smoked and to the duration and frequency of smoking (34).

Occupational exposure to airborne asbestos appears to have a great effect on the risk of developing lung cancer and mesothelioma (a cancer of the lining of the chest cavity, or mesothelium). Epidemiologic studies have indicated that the risk of developing those adverse health conditions is substantially higher for workers in asbestos industries, including miners and millers, and textile, insulation, and shipyard and cement workers. An increased rate of lung cancer has been documented in uranium miners and hard rock miners; it is believed to be related to inhalation of radon daughters. Lung cancer is also one of the major effects of exposure to high doses of ionizing radiation (34).

A number of occupational agents have been shown to contribute to the incidence of lung cancer, including chloromethyl ethers, hexavalent chromium, chromate, cadmium, nickel, inorganic arsenic, formaldehyde, and terpenes (used in wood treating) (35). Several types of occupations have been found to be related to an excess occurrence of lung cancer, even after accounting for the effects of smoking; they include shipyard workers, truck drivers, rubber workers, printers, leather workers, construction workers, and cooks (35).

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Lung cancer tends to be more common in urban than rural areas; that difference persists even after controlling for smoking habits (34). Urban air pollution has been suspected as a cause of lung cancer, but it has been difficult to establish a definitive link.

### Genitourinary Disorders (Positive Pap Smears)

The Papanicolaou (Pap) smear is indicative of cytologic (cell-related) and histologic (tissue-related) events occurring in the development of cervical cancer. The Pap smear is a method of screening cells for cervical intraepithelial neoplasia (CIN) and early invasive carcinoma of the cervix, the precursors of cervical cancer.

Most CIN is described as a process occurring in three stages. The third stage, the higher grade lesions, is regarded as more ominous than the two earlier stages; however, the immediate risk of developing invasive cervical cancer at any one stage cannot be predicted. Cell abnormalities are found in approximately 1% of all Pap smears and in approximately 2.5% of the smears of women younger than age 30. The usual development of CIN, from the first to third stage, occurs over a number of years (21,36).

Cervical cancer is considered a sexually transmitted disease that is seen most often in women who have the characteristics of people at high risk for other sexually transmitted diseases: early age at first intercourse, early pregnancy, low socioeconomic status, a history of any sexually transmitted disease, and, most importantly, a history of multiple male sexual partners. The only factor that has been shown epidemiologically to be independently related to the occurrence of cervical cancer is the number of male sexual partners. That relationship takes into account not only the number of male sexual partners that a woman has had, but also the number of sexual partners that her male partner(s) has (have) had (21).

Information available in the medical and epidemiologic literature does not indicate that environmental chemical factors play an important role in the development of cervical cancer, although the lack of such data does not necessarily rule out environmental chemicals as possible causative agents (21,36).

### Polycyclic Aromatic Hydrocarbons (PAHs)

A discussion of PAHs is warranted because the presence of cancer-causing substances is an important health concern of the community near the APCM site. It is important to emphasize that the levels of PAHs found at the APCM site are not of public health concern. PAHs found on site are at relatively low levels, and the estimated exposures of on-site workers and nearby residents are negligible. Furthermore, there is no reason to believe that PAHs are migrating off site (in significant or detectable concentrations).

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PAHs are ubiquitous in the environment; they are formed as products of ordinary combustion of carbonaceous material (e.g., wood, fossil fuels) and are present in smoke, soot, and many food items such as smoked or charbroiled meat and fish, grains, and cereals. People in the general population are exposed to high levels of PAHs from tobacco smoke, as well as food. However, in mammals, PAHs are rapidly oxidized and excreted in bile and urine.

The main public health concern about PAHs is their potential to cause cancer. However, not all PAHs have been found to cause cancer. Noncarcinogenic PAHs include acenaphthene, acenaphthylene, anthracene, fluoranthene, fluorene, methylated naphthalenes, naphthalene, phenanthrene, and pyrene.

Individual PAHs which have been demonstrated to be carcinogenic in laboratory rodents include: benz(a)anthracene, benzo(a)pyrene, dibenz(a,h)anthracene, benzo(b)fluoranthene, benzo(j)fluoranthene, benzo(k)fluoranthene, 5-methylchrysene, dibenzo(a,e)anthracene, dibenzo(a,h)anthracene, dibenzo(a,i)anthracene, and indeno[1,2,3-cd]pyrene (18). Similar experiments with Rhesus monkeys and other primates have not yet been highly successful in yielding tumors; however, application of a crude petroleum oil (as opposed to pure compounds) has induced skin cancer in monkeys (37).

Inhalation and dermal exposure to mixtures containing PAHs have also been associated with cancer in humans (e.g. lung cancer in smokers and tar roofing workers (37), skin cancer in pitch and tar workers (38), and lung cancer in coke oven and gas workers (38)). Coal tar pitch volatiles are classified as a "human carcinogen" (39), as are coke oven emissions (40).

In general, however, neither the slight elevation in cancer rates observed in epidemiological studies of PAH-exposed workers nor the slight elevation in PAH/metabolite excretion correlates with the level of exposure as measured by air analyses (41). In aluminum workers, for example, only a slight excess of lung cancer has been observed, even though the exposure is up to 3 orders of magnitude higher compared to urban atmospheres. Thus, with respect to human health effects, the hazardous components in PAH mixtures have apparently not yet been identified, and the apparent carcinogenicity of complex mixtures cannot at this time be attributed to any of the carcinogenic PAHs by themselves.

### Respiratory Tract Problems (Asthma)

Asthma is a fairly common adverse health condition that may have serious consequences; individuals with asthma have a 1 to 3% mortality rate. Despite available data on the occurrence of asthma, there are no universally accepted criteria to characterize its severity.

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The classic definition of asthma was introduced in 1962 by the Committee on Diagnostic Standards for Nontuberculosis Respiratory Diseases (42). The fundamental characteristic of asthma is obstruction of small and large airways, which results in a reduction of airflow throughout the lungs. Airway obstruction increases the work of breathing and may result in respiratory muscle fatigue, wheezing, coughing, and tightness in the chest.

Factors that may elicit an asthmatic response in susceptible individuals include genetic and hormonal factors; occupational and environmental irritants, such as sulfur dioxide, nitrogen dioxide, formaldehyde, cyanide compounds, flour, wood dust, and fumes and smoke (43,44); viral respiratory tract infections (45); and exercise and exposure to cold air (46).

Exposure to high levels of air pollutants, including sulfur dioxide, nitrogen dioxide, and particulate matter in ambient air outside of the work environment has been shown to cause acute and chronic adverse effects to the respiratory tract (47). One study conducted in Helsinki, Finland (47), reported positive, statistically significant associations between ambient levels of sulfur dioxide and both numbers of upper respiratory tract infections diagnosed at local health centers, and absenteeism from day-care centers and work places. The main sources of air pollutants in the Helsinki study were coal- and oil-fired power plants, road traffic, and general industrialization. The weekly mean (average) of sulfur dioxide concentrations ranged from 9 to 62  $\mu\text{g}/\text{m}^3$ ; the mean daily maximum was 53.0  $\mu\text{g}/\text{m}^3$ .

Laboratory models of silica, coal, and asbestos toxicity (48) have led to the prediction that pulmonary fibrosis (lung cancer) is one of the ultimate consequences of human exposure and accumulation of respirable particulate and dusts (e.g., less than or equal to 5 micrometers in the alveolar region of the respiratory tract). Because the studies involve laboratory models rather than human systems, their results may not be appropriate for use in predicting the likelihood of development of cancer in people.

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### APPENDIX F - PUBLIC COMMENTS

Comments Received During the ATSDR Public Comment Period  
March 2 - May 6, 1993

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CONCERNS RELATED TO ENVIRONMENTAL DATA

SOIL

Comment: The funny dirt in our homes is not house dust. Its greasy fine metal-like. We've lived in the house 39 years and we've never had this before.

Response: APCM did not receive hazardous waste during the last year. Therefore, the dust reported is unlikely to be related to hazardous waste from the APCM landfill. Construction has occurred on site over the past year. Soils excavated during construction could have generated dust, but dust generated during excavation of clean soil should not be contaminated.

Comment: Surface and subsurface soils on-site must be analyzed.

Response: ATSDR has received and reviewed data which show that surface soils have been sampled since 1989 along the roadway leading into the site. These data were collected to establish background soil quality and were collected in accordance with the Michigan Act 64 Soil Monitoring Program. In some of the samples, metals were detected above health comparison values. Cadmium was detected at 53 ppm in a sample collected in 1990, but did not exceed the health comparison value of 25 ppm in any subsequent samples. Chromium was detected at 470 ppm in 1989, exceeding the health comparison value of 200 ppm. Lead and zinc were both detected at a maximum of 2,600 ppm in 1989. PAHs did not exceed health comparison values in any sample. Although metals were detected above health comparison values in a few samples, metals were below health comparison values in the majority of the samples. In addition, access to the site is restricted by an eight-foot chain link fence and security personnel, making public access to on-site soil unlikely.

AIR

Comment: Air monitoring studies must be done, particularly regarding carcinogenic PAHs.

Response: Under the Michigan Act 64 operating license for APCM, the facility is required to implement an ambient air monitoring program when hazardous waste disposal operations are resumed at the facility. This program will routinely monitor for total suspended particulates (TSP) and several metals including cadmium, lead, total chromium, and zinc. Hexavalent chromium will be included in the routine analyses if total chromium is ever equal to or greater than 5 µg/m<sup>3</sup>. If wastes entering the landfill are likely to contain semi-volatile organic chemicals, the

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Michigan Department of Natural Resources (MDNR) can amend the monitoring plan to include semi-volatile organic chemicals such as PAHs.

**Comment:** On page 15 of your report under "Air," the landfill operator's air monitoring program for sampling of suspended dust has been submitted to our Wayne County Air Pollution Control Division (WCAPCD). Any future operation of this site will be subject to day-to-day air monitoring on a regular schedule. Air monitoring at WCAPCD sites in Allen Park, River Rouge, and Dearborn have shown no elevated levels of heavy metals. On the contrary, measured levels of respirable heavy metals has decreased dramatically between the years 1972 and 1991 (the last year of fully-compiled data).

Additionally, page 18 of your report under "Air (particulates)," fugitive dust control requirements specific to Wayne County apply to this landfill. Suspended dust monitoring at the site is designed to disclose any lack of control. PAH's such as benzo (a) pyrene are measured quarterly at both the Allen Park and Dearborn sampling sites of the WCAPCD. These measured levels have decreased dramatically since 1972. It is also important to note that Appendix E on page 63 of your report identifies PAH measured in dust at the Allen Park Clay Mine site as negligible in quantity.

**Response:** ATSDR has reviewed air monitoring data for PAH's collected by at WCAPCD sites in Allen Park, River Rouge, and Dearborn and has incorporated this information into the public health assessment. ATSDR will consider additional follow-up activities if air monitoring data become available that people have been or are being exposed to site-related contaminants.

**Comment:** Who will review the air monitoring that will be conducted when the new hazardous waste disposal cell begin receiving waste?

**Response:** The Wayne County Air Pollution Control Division (WCAPCD) and the Michigan Department of Natural Resources (MDNR) will review the results of the air monitoring program.

**Comment:** Data gaps and lack of both on and off-site air monitoring make it impossible to conclusively determine whether ambient air is a potentially likely exposure pathway for contaminants that might have affected our health in the past and contributed to elevated cancer rates. This is an uncertainty that must be addressed for our residents.

**Response:** Long-term, on-site ambient air monitoring was not collected in the past. In addition, no off-site air monitoring data was collected which would indicate if nearby residents were exposed to site-related contaminants, to what degree, or for how long a time period. Without this information, ATSDR cannot conclusively determine if a completed pathway existed in the past through ambient air or if

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exposure to contaminants in the air contributed to elevated cancer rates. However, ATSDR can state that nearby residents had the potential to be exposed to site-related contaminants through ambient air and that the health of nearby residents, therefore, had the potential to be impacted by site-related contaminants.

**Comment:** The summary at the beginning of the assessment states that "Metals have also been found in on-site air." We recommend this statement include that the concentrations were below the levels of public health concern.

**Response:** The detection level for chromium was above ATSDR's health comparison value. Therefore, ATSDR cannot be sure that the concentrations were below the levels of public health concern, depending on the exposure scenario.

**Comment:** The use of a .000083  $\mu\text{g}/\text{m}^3$  detection level for Cr (total) is inappropriate (See also Table 7). Common method detection levels for total Cr and Cr + 6 are ordinarily 2500 ppb and 200 ppb, respectively, for analysis in soil or particulate matter that consists primarily of soil.

**Response:** There are three major forms of chromium (Cr), which differ in their effects on health. One major form, hexavalent chromium (chromium VI), has been associated with skin irritation and liver and kidney damage in humans and with cancer in animal studies (12). Because the data were for total chromium in air, ATSDR could not determine the percentage of chromium VI in the samples. Therefore, ATSDR chose to be conservative and use the health comparison value for Chromium VI. ATSDR's health comparison value for Chromium VI in air samples is set at .000083  $\mu\text{g}/\text{m}^3$  because adverse health effects are possible above this level.

**Comment:** The presence of "contaminants" in the subject air samples resulted from the close proximity of a large scale placement of clean top soil containing naturally occurring metals during the closure of Cell I. It is also noteworthy that the site is bounded on two sides with high traffic 6 lane urban freeways that have been shown elsewhere to be the source of emissions associated with vehicular traffic. The reference to contaminants here is misleading and should be more appropriately be identified as "constituents". The use of the term "contaminants" incorrectly portrays an impression that a release to the environment has occurred from landfilling operations, which is not possible. Without explaining the circumstances behind these results, incorrect conclusions are drawn.

**Comment:** The low level presence of metals in on-site air sampling is not unexpected and may represent normal ambient air quality. The low lead levels reported are most likely attributable to adjacent freeway vehicular emissions.

**Comment:** The reference to "contaminated" soil particles entering the air during the closure of Cell I is inaccurate. The soils in question were uncontaminated "clean" topsoil unrelated to landfill operations which contains naturally reoccurring metals. The low lead levels measured on-site show no correlation with the TSP.

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Therefore, the lead is more than likely attributable to vehicle emissions from the adjacent freeways. The Act 64 operating license requires the implementation of an ambient air monitoring program. The results of this program, as is the case with all analyses performed at the site, will be submitted to MDNR and local officials. The assertion that additional air monitoring is required during "normal" activities implies monitoring unrelated to landfilling operations. This assertion is unsupported, inappropriate, and should be removed from the report. The sampling program planned for Cell II operations will provide the appropriate data to assure safe operations of the hazardous waste management facility. The vague and inconclusive nature of these statements ("may have been, many now be, and could in the future") fails to take into account that air quality is addressed through the Ambient Air Monitoring program, and thus inappropriately creates a sense of unchecked air pollution emissions.

Response to above 3 comments: ATSDR uses the term "contaminants" to discuss levels of chemicals detected in the environment regardless of their origin. ATSDR recognizes that contaminants detected in the air on and off the APCM site may not be attributable to the facility.

The only on-site air sampling data available for APCM was collected between August and November 1986 during the closure of Cell I. The level of particulates in the air ( $1,089 \mu\text{g}/\text{m}^3$ ) did exceed ATSDR's comparison value ( $260 \mu\text{g}/\text{m}^3$ ). Particulates generally enter the air during earth moving activities, such as the closure of Cell I. It is therefore likely that the particulate levels were related to landfill operations. The lead levels detected during the 1986 sampling period was below ATSDR's health comparison value. It is possible that some of the lead detected in the air was related to vehicle emissions.

Because of the lack of on and off-site air monitoring data in the past when the facility was receiving hazardous waste, ATSDR cannot determine whether unchecked air pollution emissions occurred or if nearby residents were exposed to contaminants potentially released during hazardous waste management activities. In addition, no off-site air data were collected during closure of Cell I. As a result, ATSDR cannot determine whether particulate levels, which were above health comparison values on site, were also above health comparison values off site. The facility is not currently receiving hazardous waste and, as a result, exposure of nearby residents to airborne contaminants related to hazardous waste disposal is unlikely at the present time (October 1993). However, because the facility is intending to receive hazardous waste in the future, it is possible that nearby residents could be exposed to airborne site contaminants in the future. ATSDR agrees with MDNR and WCAPCD that air monitoring is needed when the facility is receiving hazardous waste. ATSDR supports the ambient air monitoring requirements specified under the facility's Michigan Act 64 operating license.

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Comment: Reference to potential exposure pathways related to excavation and construction is incorrect. All excavation and construction activities are performed outside of the hazardous waste disposal area. Rare exceptions necessitate the use of personal protective equipment as required by law. Construction activities performed in close proximity to an active hazardous waste disposal cell require special precautions designed to protect the individual worker. Construction activities within the landfill site but outside of the operating cells are no different than typical earthwork construction activities.

Comment: Reference to air sampling performed during Cell I closure inaccurately portrays the data in support of conjecture and hypothesis.

Response to above 2 comments: Excavation and construction have the potential to generate particulates (dust), and this dust can be carried through the air to nearby residents. In the air sampling data collected during closure of Cell I in 1986, the level of particulates in the air ( $1,089 \mu\text{g}/\text{m}^3$ ) did exceed ATSDR's comparison value ( $260 \mu\text{g}/\text{m}^3$ ). ATSDR considers all site-related data when conducting a public health assessment. In this case, ATSDR does not limit itself to only those activities related to hazardous waste disposal.

Comment: The prevailing wind direction is from the southwest. Given this fact, the Snow Woods neighborhood is upwind from the APCML and should be least potentially impacted by site operations. Other factors, not APCML, should be considered as possible factors impacting public health.

Response: Although the prevailing wind direction is from the southwest, the Snow Woods community could still be impacted by airborne contaminants from the APCM landfill. The Snow Woods community is located within one-quarter mile of the site and, on days with calm winds, airborne contaminants from the site could reach the community. In addition, although wind blows away from Snow Woods (toward APCM) most of the time, wind does occasionally blow toward Snow Woods from the site. ATSDR does recognize, however, that factors other than the proximity to APCM may be related to the excess of brain cancer in Snow Woods. The ATSDR Health Activities Recommendation Panel recommended a health statistics review and a community health investigation to further evaluate the elevation of brain cancer rates in Snow Woods.

Comment: Beginning on page 12 of your report, we question the identification of materials shown in table 8, "Summary of Air Releases," as it relates to the operation of the Allen Park Clay Mine site. It does not appear that these materials pertain to the contents of the landfill or as the TRI (toxic release inventory) report is normally applied as a means of accounting toxic chemicals that are candidates for disposal from industrial sources. The ATSDR must clarify this point or delete table 8 and all related discussions in your report as inappropriate.

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**Response:** The Toxic Chemical Release Inventory (TRI) is an on-line database, maintained by EPA, containing information (self-reports from chemical manufacturers and other companies throughout the United States) about more than 320 different substances released from facilities into the environment since 1987. ATSDR uses this information in the qualitative assessment of contamination found in on-site and off-site media. In the APCM Public Health Assessment, ATSDR conducted a TRI search for self-reported releases of contaminants found in media on the APCM site to identify other possible sources of those contaminants. Self-reported releases from companies in Wayne County, Michigan, and for the Allen Park, Dearborn, Dearborn Heights, and Melvindale communities were evaluated. ATSDR found that air releases for chromium, lead and zinc, but not for cadmium, were reported in these areas between 1987 and 1990. ATSDR discussed this information on page 12 of the APCM Public Health Assessment under the heading "Toxic Chemical Release Inventory".

### GROUNDWATER

**Comment:** ATSDR should carefully consider the implications of the statement that "contaminants" have been detected in the groundwater beneath the facility. Contaminants infers a release from a known source. Without further information as to whether the constituents present in the groundwater represent a) upgradient or downgradient conditions; b) the total or dissolved fraction of the sample; c) a natural occurrence versus a release; it seems more appropriate to state that elevated levels of some constituents are present in the groundwater.

**Comment:** The assessment makes conclusions about metals contamination based strictly upon the laboratory derived number for the chemical constituents. These metal levels may be the natural mineralized condition of this aquifer which makes it unusable. Also, the assessment does not appear to consider the limitations associated with using older metals data. The metals data needs to distinguish whether this is totals or dissolved and not "combined".

**Comment:** The presence of certain naturally occurring constituents in the groundwater is improperly characterized as "contamination". The same section acknowledges that the deep aquifer is "highly mineralized". The presence of naturally occurring constituents in the groundwater is well understood. Any implication that this represents contamination from the APCML is unsubstantiated, inappropriate, and reflects an incomplete understanding of site hydrology.

**Response to above 3 comments:** As explained in the response to comments in the air section, ATSDR uses the term "contaminants" to discuss levels of chemicals detected in the environment regardless of the source of those chemicals. ATSDR recognizes that the chemicals detected in the groundwater at APCM may not be related to the site and that these chemicals could be naturally occurring or the result of a release upgradient of APCM. ATSDR also recognizes that older metals data have limitations with regards to field and analytical techniques. While metals

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data should distinguish among total, dissolved, or combined levels of contaminants, the data available in reference 3 did not do so. Therefore, ATSDR chose to be conservative and reported the values as listed in the laboratory reports.

**Comment:** The groundwater section entitled "On-site Contamination" does not discuss the possibility/likelihood that sources other than the facility are responsible for the elevated constituents present in the groundwater. When discussing the maximum concentration values for constituents present in the groundwater, this section needs to address whether the sampling locations are upgradient or downgradient of the facility, and for the deep aquifer, the hydrogeologic factors that would limit the potential downward migration of contaminants. Table 6 should identify the well where each of the maximum concentration values were detected.

**Response:** ATSDR discussed the possibility and likelihood that sources other than the facility are responsible for contaminants present in the groundwater in the Pathways Analyses section of the APCM Public Health Assessment. In the Pathways Analyses section, ATSDR also discussed hydrogeologic factors that would limit the potential downward migration of contaminants. ATSDR added a discussion of whether the sampling locations are upgradient or downgradient of the facility in the On-Site Contamination section and in Table 6. In Table 6, ATSDR also identified the wells where the maximum concentration values were detected.

**Comment:** An implication is made that the presence of trace elements in the groundwater, storm water, and sediment are the result of contaminant release from the landfill. It is noteworthy that these elements (metals) are naturally occurring and their low level presence has never been shown to have resulted from contaminant release from the landfill. In fact, the geology of the site, which includes an extensive clay deposits below the landfill and an artisan bedrock aquifer, combine to form an effective barrier to leachate migration off-site. The APCML has been granted a groundwater monitoring waiver from the U.S. EPA and the Michigan Department of Natural Resources (MDNR) because it has been irrefutably shown that off-site migration via the deep aquifer is not possible. The reference to possible off-site groundwater monitoring totally disregards the unique hydrogeological conditions that preclude off-site migration of contaminants via the groundwater pathway.

**Comment:** Groundwater contamination is not an issue. Any suggestion that off-site groundwater monitoring be performed is completely unsubstantiated and reveals a lack of understanding of site hydrogeology. Thus, such statements should be removed from the report.

**Response to above 2 comments:** ATSDR reports levels of chemicals detected above health comparison values regardless of the origin of those chemicals. ATSDR recognizes that the chemicals detected in environmental media may not be

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the result of contaminant release from the landfill. In the Pathways Analyses section of the APCM Public Health Assessment, ATSDR stated hydrogeologic conditions at the site make it unlikely that wastes from the site could contaminate the groundwater. Although groundwater contaminants may be unrelated to the landfill, chemicals were detected in groundwater above health comparison values. In order to protect public health, ATSDR recommends that off-site groundwater be monitored or that efforts are made to ensure that private well water is not used unless treated regardless of the origin of those chemicals.

**Comment:** ATSDR should consider including an appendix in the back of the document containing copies of the analytical data.

**Response:** ATSDR does not include copies of the analytical data in public health assessments. ATSDR does, however, reference the source of analytical data so that interested parties can locate the information. The sources of analytical data in the APCM Public Health Assessment can be found in the reference section of the document.

**Comment:** The reference to a shallow aquifer is misleading. The 70 foot clay layer separates the deep artesian aquifer from the shallow perched water condition that is incapable of "yielding a significant amount of groundwater". Thus, this groundwater is not considered an aquifer according to federal and state regulatory definitions.

**Response:** ATSDR has incorporated this information into the public health assessment.

**Comment:** Shallow groundwater monitoring wells referenced in the Groundwater section on this page were installed at the APCML to serve as a surrogate for surface water sampling. Perched water sampling is conducted under the Act 641 Surface Water Sampling program when there is no water present at the surface to otherwise obtain a sample. These wells were constructed using galvanized pipe and as such would be expected to exhibit small amounts of metals as the pipes age and slowly corrode.

**Comment:** The Wayne County Health Department has already conducted substantial analysis of available groundwater data in the area. That analysis continues to demonstrate no adverse effects on off-site groundwater quality. Monitoring well design and construction practices, as well as corrosion of galvanized steel well casing, are possible sources for the levels of metal cited by ATSDR.

**Response to above 2 comments:** ATSDR has incorporated this information into the Environmental Contamination and Pathways Analyses sections of the Public Health Assessment.

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**Comment:** On page 19 of your report under "groundwater" Wayne County has regulated installation of water supply wells, through a permit system, for nearly 40 years. Well-drilling contractors secure permits prior to installation and subsequently submit Water Well Records (well logs). Our department has Water Well Records for five attempts from September 1967 through December 1988 to develop wells within a mile and a half or so of this site. All such attempts were abandoned and the certified well driller indicated that each of those efforts resulted in a "dry hole." In addition, one dewatering well for purging contaminated groundwater was drilled at approximately a mile and a half northeast of the site in 1991. This was a state-regulated effort to resolve a localized groundwater contamination incident.

**Response:** ATSDR has incorporated this information into the public health assessment.

**Comment:** Are there any known uses for groundwater?

**Response:** As discussed in the comment above, the Wayne County Department of Public Health has conducted analysis of available groundwater data in the area. There are no known uses for groundwater in the area.

## SURFACE WATER, SEDIMENT, and LEACHATE

**Comment:** Contrary to the statement that there are "very few" collected samples of surface water, surface water samples are collected and analyzed routinely under both Act 64 and Act 641 operating licenses with the results forwarded to MDNR and various city representatives. Under the Act 641 license, surface water samples are taken quarterly. Under the Act 64 license, background surface water sampling is done whenever rainfall exceeds one half inch during a 24 hour period.

**Response:** ATSDR has incorporated this information and data into the public health assessment.

**Comment:** The sediment settling pond is not a "treatment" facility as indicated in the text here and elsewhere in the document. As a storm water sedimentation pond, it simply functions as an erosion control device that minimizes the movement of soils off-site. It also is designed as a flow equalization device that manages peak storm water flows so that off-site drainage systems are not overloaded.

**Response:** ATSDR has incorporated this information into the public health assessment.

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**Comment:** Cell I was incorrectly identified as having a leachate collection system installed upon closure of the cell. The leachate collection system was actually expanded during Cell I closure.

**Response:** ATSDR has incorporated this information into the public health assessment.

**Comment:** The assertion that leachate "probably" discharged into the surface drains and became an exposure pathway is unsupported and inappropriate. Conjecture should be noted as such and not used as a basis for drawing conclusions not based on fact.

**Response:** ATSDR routinely identifies potential exposure pathways. Leachate from the non-hazardous waste cells could have discharged into the surface drains prior to 1982 when the leachate collection system was installed. Therefore, ATSDR identifies this as a past potential exposure pathway.

**Comment:** The statement that there are limited sampling regarding sediment sampling is inaccurate. A Sediment Sampling Program is part of the APCML Act 64 license and is carried out semiannually with all analytical results forwarded to MDNR and various city representatives. Based on these results, it is suggested that the second to the last sentence of this section (which begins "Exposure may have ....") be replaced with the following sentences:

It is unknown if exposure occurred in the past. However, no exposure occurs now and exposure should not occur in the future. Extensive monitoring required by state and federal permits is conducted to verify that exposure does not occur.

**Response:** ATSDR has revised the public health assessment to reflect additional information regarding sediments received during the public comment period.

**Comment:** FO39 multi-source leachate, added to the State Act 641, was not tested. What will transpire when leachate is added to a cell constructed for solid waste?

**Response:** The APCM facility is designed with a double liner system with a leak detection and removal system between the liners. If any leakage were to occur through the primary liner, it would be collected and removed. Under Michigan State Act 64, the operating license requires routine inspection and maintenance of the liner system to ensure its proper operation. In addition, if the facility requests to receive a different type of waste, then new waste codes would go into effect.

**Comment:** According to the ATSDR study, leachate from the APCM is now being discharged into the sanitary sewer system. We need to know what will happen

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during heavy rainstorms if residents' basements begin to flood. Melvindale, located between the APCM and the river into which the rainwater is discharged, could be flooded with toxic leachate from the APCM. These pathways need to be tracked.

**Response:** Leachate from APCM is discharged into the sanitary sewer system and transported to the Detroit Sewage Plant. The Detroit Sewage Plant treats the wastewater it receives and analyzes its outfall to ensure that the outfall is within accepted standards. Should backflow occur in the sewer system, any leachate present would be highly diluted and unlikely to be found at levels of public health concern. In this situation, the primary public health concern would be the presence of raw sewage in resident's basements. Backflow preventers, if built into the sewer systems of individual residences, would prevent backflow of wastewater into the residences.

**Comment:** The pollutants in the Allen and Tyre Drains need to be completely analyzed.

**Comment:** Complete analyses of the polluted Allen and Tyre Drains must be done.

**Response to above 2 comments:** On-site sampling of sediments and surface water in the Allen and Tyre drains did not detect contaminants at levels of public health concern. Levels of contaminants in off-site drains would not be expected to be higher than those on site. In addition, the Allen and Tyre Drains are now enclosed in pipe under the ground surface in most off-site areas. Public access to the drains is therefore unlikely. Finally, leachate from APCM is now collected and discharged into the sanitary sewer system, not into the drains.

**Comment:** Rouge Rescue, an environmental project in its 8th year, is held .8 mile of the APCM. Several high schools in the area have also begun work to clean up the creeks and drains in the area. The polluted Allen and Tyre Drains, Ecorse Creek, etc. must be posted with warning signs.

**Response:** The level of contaminants in storm water runoff and sediments on-site are already below levels that would pose any health hazard to people intermittently exposed. In the event of off-site migration, contaminant levels would be further diluted by several orders of magnitude by the time runoff from the site reached the creeks and drains in question. Warning signs are, therefore, unnecessary.

**Comment:** Our department has consulted with knowledgeable Melvindale city and school officials and conducted a visual audit of the Tyre and Allen Drains and found no cause for concern attributable to the Allen Park Clay Mine. If any further investigative work is deemed necessary, it could include sediment samples from each drain just downstream from the landfill site. These samples would indicate what, if any, types of material have escaped from the site.

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Response: ATSDR has included this comment into the public health assessment as requested by the Wayne County Department of Public Health.

### MULTI-MEDIA

Comment: The Waste Management Division of the Michigan Department of Natural Resources contains sampling data from 1989 to the present that was not considered in the assessment.

Response: ATSDR has reviewed additional sampling data from the Waste Management Division of the Michigan Department of Natural Resources and incorporated this information into the public health assessment.

Comment: Throughout the tables, and the entire report for that matter, parameters analyzed are identified as "contaminants" rather than "constituents". Consideration must be given to the presence of naturally occurring metals normally found in uncontaminated soils. By referring to these parameters as "contaminants", an improper inference is being made that their presence is the result of a man-made release to the environment. Because APCML is the focus of this report, further association is made that the APCML is the source of the "contamination" which is not supported by the facts presented.

Response: ATSDR uses the term "contaminants" to discuss levels of chemicals detected in the environment regardless of their origin. ATSDR does not indicate that all contaminants reported in the public health assessment are attributable to APCM.

Comment: Carcinogenic PAH was totally ignored and testing was never ordered.

Response: According to the APCM Public Health Assessment, on-site concentrations of carcinogenic polycyclic aromatic hydrocarbons (PAHs) were <500 ppb in treatment pond water, 15 ppb in runoff water from the Tyre drain, and 0.776 mg/kg in treatment pond sediments. Data for carcinogenic PAH in on-site groundwater and air is lacking. However, concentrations of non-carcinogenic PAH were 20 ppb and 18 ppb in shallow and deep groundwater, respectively. The ATSDR concluded that (1) the contaminants found in storm water runoff and sediments were at concentrations that pose no danger to humans exposed intermittently, and (2) the groundwater, which does contain contaminants at levels of health concern, nevertheless poses no threat to human health as long as it continues to be unused.

Comment: There were a number of items listed in the ATSDR study that were never addressed by the study. In order to complete the study, the following must be done:

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a. Page 2, paragraph 3: "However, ATSDR has identified data gaps that limit ATSDR's ability to fully evaluate this site. According to the facility's operating license, air monitoring will be conducted when the new hazardous waste disposal cell begin receiving waste. ATSDR recommends review of this air data...."

b. Page 2, paragraph 4: "ATSDR's Health Activities Recommendation Panel (HARP) has reviewed the APCM site to determine if any follow-up health activities are indicated. Because of the elevation of brain cancer incidence rates, the panel determined that a community health investigation and health review is indicated...."

c. Page 7, Paragraph 6: "Respiratory disease data in communities surrounding the site do not appear to exist, even on the county level."

d. Page 10, paragraph 2: "Surface and subsurface soils have not been sampled at the site, and limited information is available to define waste types and concentration in subsurface waste cells."

Comment: The following items, addressed by the ATSDR have been left incomplete:

a. Page 3, paragraph 4: "Completed Exposure Pathways. No completed pathways were identified; one or more elements of the pathway analysis were missing for each medium evaluated."

b. Page 14, paragraph 3: "On-site contaminants may have entered storm waters and migrated off site through the drainage system.... Exposures may have occurred in the past, currently, or may yet in the future; however, no information is available on the magnitude, frequency, and duration of exposures for any of those time frames."

c. Page 14, paragraph 4: "Children who play in the drainage ditches could have been exposed to metal and PAHs through dermal contact and inadvertent ingestion. No information is available on the concentration of contaminants (no off-site sampling data are available or the frequency or duration of exposure).

d. Page 14, paragraph 5: "As were surface water data, on-site sediments data are also limited." Page 15, paragraph 1: "No information is available on the magnitude, frequencies, and duration of exposures."

e. Page 16, paragraph 1: "On-site groundwater are contaminated with heavy metals and PAHs, people who use the water could be exposed to contaminants through dermal contact, inhalation of volatilized contaminants and ingestion."

f. Page 16, paragraph 4: "Leachate was eliminated as a current or future exposure pathway because it is currently discharged to the sanitary sewer."

Comment: Because of enormous gaps in ATSDR study, we would like funding to hire outside consultants to complete all of the above work.

Comment: We want input from our own consultants and we expect the funding to come from ATSDR. ATSDR has shown, by its own report, that it is incapable of doing a proper study; therefore, we want to do it ourselves and expect the funding to do it.

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**Comment:** We would also like ATSDR to hire an outside consultant to review this current study.

**Response to above 5 comments:** An ATSDR public health assessment is the evaluation of existing data and information on the release of hazardous substances into the environment in order to assess any current or future impact on public health, develop health advisories or other recommendations, and identify studies or actions needed to evaluate and mitigate or prevent human health effects. ATSDR public health assessments are not health studies. ATSDR public health assessments also do not routinely involve collection of environmental samples. ATSDR public health assessments represent an initial step in the process of addressing complex environmental and public health issues. As part of this process, ATSDR public health assessments identify data gaps and make recommendations to help address those data gaps. For example, the APCM Public Health Assessment recommends analysis of air samples for metals, particulates and organic chemicals of concern. A community health investigation and a health statistic review were also recommended to further investigate the elevation of brain cancer rates in Allen Park. While consultants may be retained for health studies and environmental sampling by other interested parties, such as a citizen, citizen groups or industry, ATSDR currently is not permitted by Congress to provide community technical assistance grants. For further information on the specific concerns raised in this comment, see the public comments sections for environmental media and health outcome data.

**Comment:** 2. Page 10, paragraph 5: "The following subsection summarize data compiled by Ford Motor Company and submitted in the RCRA Facility Investigation Phase I, Environmental Monitoring Report, Allen Park Clay Landfill (3)." This data is highly suspect and must be checked. In particular, we feel the following incomplete and neglected data and data sampling must be addressed:

a. Page 10, paragraph 6: "Results of leachate taken in 1984 & 85 from the landfill area show the presence of cadmium, chromium, lead, and naphthalene, a noncarcinogenic polycyclic aromatic hydrocarbon (PAH). The leachate is currently discharged to the municipal sanitary sewer system."

b. Page 11, paragraph 1: "The APCM site has a perimeter drainage system that empties into two major drains from the site, the Allen Drain northeast of the site, and the Tyre Drain southwest of the site. The site also has a treatment-and-setting pond that collects rainwater runoff from the site and discharges into the perimeter drainage system that eventually empties into the Allen and Tyre Drains... Very few surface samples have been collected from the site drains and treatment pond that discharges into the site perimeter drainage system..."

c. Page 11, paragraph 4: "Ford Motor Company has installed groundwater monitoring wells at the APCM site.... Levels of cadmium, chromium, zinc, and lead exceeded ATSDR comparison values and will be further evaluated in the Pathways and/or Public Health implications sections of this assessment..."

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However, in the Public Health Implications Section (Page 19, paragraph 1) ATSDR states: "The source of those contaminants are not known; however, the concentrations of the contaminants are such that chronic exposure would have serious public health implications. No off-site groundwater monitoring data were available for ATSDR review..."

d. Page 12, paragraph 1: "Air monitoring data were collected in 1986 when Cell I was being close... Levels of the particulates in the samples exceeded comparison values; the chromium detection limit was above ATSDR comparison value." However, Page 18, paragraph 3 states: "The most likely pathway by which nearby residents and on-site workers may be exposed to contaminants at the APCM site is air." But ATSDR went on to state (Page 15, paragraph 3) "No long-term, on-site ambient air monitoring data are available for evaluation by ATSDR; therefore, the consequences of on-site exposure to contaminated ambient air are unknown."

e. Page 12, paragraph 2: "Off-site environmental monitoring data for all media (air, soil, surface water, groundwater, sediment) were not available for areas adjacent to the APCM site."

f. Page 12, paragraph 3: "The conclusion and recommendations made in this public health assessment were arrived at using data developed by the Ford Motor Company...."

**Response:** In preparing this public health assessment, ATSDR has relied on the information provided in the reference documents and assumes that adequate quality control measures were followed with regard to chain-of-custody, laboratory procedures, and data reporting. Quality assurance and quality control (QA/QC) programs assure the reliability and accuracy of monitoring and measurement data. Data developed by the Ford Motor Company was subject to the QA/QC requirements of EPA and the State of Michigan. When descriptions were provided, the quality assurance and quality control (QA/QC) measures appeared to be consistent with measures normally taken during environmental sampling and analysis. The data are assumed to be accurate within the limits of the QA/QC procedures used.

**Comment:** The Wayne County Health Department and the Michigan Department of Natural Resources regularly inspect this site and also monitor and review ambient air quality data. In addition, any new groundwater monitoring data available will be reviewed through EPA's GRITS computerized analysis system to confirm that the health of citizens is not at risk from groundwater. Our department has determined from the ATSDR health assessment and other available information that additional off-site sampling of the water column in nearby streams is not warranted at this time. We expect that completion of the federal health assessment and continuing state and county regulatory efforts will demonstrate that the licensed landfill results in environmentally sound waste disposal and the protection of health of nearby residents.

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Response: ATSDR has incorporated this information into the public health assessment.

### LAND USE

Comment: The Veteran's Administration Hospital located immediately southwest of the APCM is separated from it by a one-lane dirt road, not a three-lane highway as suggested in the study.

Response: In the Land Use section of the APCM Public Health Assessment, ATSDR identified a three-lane road (Oakwood Boulevard) to the north of the site. ATSDR did not state that the Veteran's Administration Hospital, located southwest of the APCM, is separated from the site by a three-lane highway. The Veteran's Administration Hospital is separated from the site by a light duty, improved surface road according to the U.S. Department of the Interior Geological Survey (41).

Comment: Concern was expressed that the following institutional land use facilities were not discussed in the assessment:

- a. Oakwood Hospital, a 515 bed complex, is located 2000 feet west of the APCM entrance.
- b. Best Western Motor Inn, with 209 rooms and an open air pool, is approximately 750 feet east of the APCM entrance.
- c. Greenfield Village/Henry Ford Museum, world-famous tourist attractions, are located 0.9 of a mile of the APCM entrance.
- d. A major, exclusive golf course is located within a mile of the APCM.
- e. The Hyatt Regency/Radisson Hotel convention complex (770 rooms) is 1.2 miles north of the APCM facility.
- f. The city of Melvindale's outdoor swimming pool is located .8 mile east of the entrance to the APCM.
- g. Frito-Lay Corporation manufactures potato chips at .6 mile from the APCM.
- h. The outdoor swimming pool at the Fairlane East Apartment Complex is 1.3 miles from the APCM.
- i. Oakbrook Commons, a medical complex containing senior citizens apartments, assisted living units and a 24-hour care nursing home is located exactly 1 mile from the APCM.
- j. The U.S. Post Office Bulk Mailing Center is located .1 mile northwest of the APCM.

Comment: Several shopping centers are located within one square mile surrounding the APCM, including Fairlane -- a major mall.

Comment: The number of schools, elementary, middle and high, should have been noted in the study. Snow Elementary School, for instance, is located .5 mile west of the APCM. Melvindale's Strong Junior High is located 1 mile east of the APCM.

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Comment: Under recreational land use, backyard swimming pools should be taken into consideration in all surrounding communities.

Response to above 4 comments: ATSDR recognizes that within a one mile radius of a site there may be many institutional and recreational uses of land, particularly in an urban area. ATSDR describes some specific examples in public health assessments to provide information on general land usage in the area. However, a listing of all institutional and recreational uses of land is not usually possible, nor would such a listing add substantially to the public health implications of the health assessment.

Comment: The Ford Rouge River Plant (page 6, paragraph 6) is located 2 miles north of the APCM, not 1/4 mile.

Comment: The Ford Motor Company Rouge Manufacturing Plant was incorrectly identified as the Ford Motor Company Rouge River Plant.

Response to above 2 comments: ATSDR has incorporated this information into the public health assessment.

### GENERAL

Comment: The public availability session held by the ATSDR staff was held at the Allen Park City Hall, not the Dearborn City Hall.

Response: ATSDR records indicate that the public availability session was held at in the Dearborn City Hall.

Comment: In conclusion #1, the statement ignores the present status of operation at the APCML and speculatively implies that these operations may present a health hazard. If past operations presented indeterminate potential health hazards, the report should say so. If present operations and controls address these issues, this also should be stated.

Response: ATSDR has clarified conclusion #1 to indicate that APCM presented an indeterminate public health hazard in the past because additional information is needed to evaluate possible air exposure pathways. The permit for a new waste cell at APCM requires periodic air monitoring. This monitoring combined with appropriate control efforts mitigates future public health risk due to exposure to airborne contaminants.

Comment:

Section A. Typographical Errors:

1. Page 3, paragraph 2: "Michigan Act 651" should be changed to "Michigan 641."

2. Page 4, paragraph 5: Please define the phrase, "ease of site access."

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Response: ATSDR has corrected this typographical error in the public health assessment. Ease of site access refers to the ease with which unauthorized personnel can enter site boundaries. ATSDR evaluates ease of site access because site accessibility is likely to affect the number of potentially exposed individuals. Humans can contact contaminated media if access to a site is not restricted or otherwise limited.

Comment: No exposure pathways were charted for people who will be exposed during inevitable truck accidents and system malfunctions.

Comment: A warning system in case of truck accidents, system malfunctions and other disasters must be installed at the APCM.

Response to above 2 comments: The APCM facility has a contingency plan which provides for rapid intervention should a release of hazardous substances occur during transportation accidents, system malfunctions, and other releases related to APCM.

Comment: The implications of storing solid waste in the clay mine, which is located over an existing, abandoned salt mine, have not been dealt with. No geographical or topological studies have been done by ATSDR. The salt mine is riddled with water, weakened pillars and roof falls. Approximately 14,000 gallons of water are being pumped out of the salt mine and into the Detroit Sewer System on a daily basis. If the storage of the waste at the APCM should collapse the salt mine, will the contamination spread into the water and, eventually into the Great Lakes?

Comment: Investigative studies of the salt mines have deduced that the weakest area of the roof is directly below the APCM.

Comment: There are many old wells, as well as oil and gas bore holes in the area. Could leachate from APCM leak into the salt mine and contaminate the water being pumped into the Detroit Sewer System?"

Response to above 3 comments: ATSDR and MDNR have evaluated the potential for collapse of the salt mine and the impact that such a collapse would have on APCM. The salt mine lies at an approximate depth of 1,100 feet below the surface. Analysis of the thickness and strength of the overlying rock structure indicates that a collapse of the salt mine would not affect the integrity of the landfill. Because the integrity of the landfill would not be affected, hazardous substances from APCM would not contaminate water underlying the site or any oil and gas bore holes near the site (49).

Comment: Toxicological studies should be done on plant life in the area, as grape vines growing on the fences surrounding the APCM are picked by many people for various handicraft and other projects.

## ALLEN PARK CLAY MINE

Response: The contaminants found on site were mostly metals and PAHs. Plants may absorb and accumulate metals from the soil via their root systems, and PAHs may be deposited on the surfaces of leaves, etc. Thus, provided they are washed first and not eaten afterward, such plants could be safely used for "various handicraft and other projects".

Comment: The area of the APCML is 243 +/- acres, not 260 acres as indicated. The reference to Cell IV receiving a license in October 1992 is not accurate. Cell IV was part of the Michigan Act 641 solid waste disposal license renewal in October 1992, which included Cell III and the old landfill. Cell IV was licensed for operation on April 23, 1992 upon approval of the construction certification by the MDNR in accordance with the operating license then in effect.

Comment: Please note on page 3, paragraph 2, of your report, "Michigan Act 641 of 1978." The company received a Michigan Act 641 solid waste disposal license on October 13, 1992, and is now accepting non-hazardous solid waste.

Response to above 2 comments: ATSDR has incorporated this information into the public health assessment.

Comment: Security at the site is maintained by Ford security personnel who are on call 24 hours a day in the event of an incident. On-site security is maintained during periods of active landfill operations.

Response: ATSDR has incorporated this information into the public health assessment.

Comment: Beginning on page 8 of your report, you summarized some "community health concerns" in a series of questions. We (the Wayne County Department of Public Health) would like to respond to some of these questions and concerns.

Your Question 3: "How will local residents with preexisting adverse health conditions (such as asthma) be affected by this landfill?"

Our Response: Residents with preexisting asthma or other upper respiratory obstructive diseases would be affected by many types of respirable dust from both industrial and natural sources. The cap and ground cover which were a requirement of the 8-acre excavation when it was closed in 1986 serve to protect the displacement of any landfill material through local winds. Any inhalable dust relatable to this ground cover would be expected to reflect only natural surface dust together with any settleable dust from other local sources. Windblown dust from the active portion of the landfill would be disclosed by Wayne's County required air pollution monitoring and fugitive dust control programs. Measured levels of concern would produce an appropriate enforcement response by our department.

## ALLEN PARK CLAY MINE

Further reference (op. cit., p-64/65) to asthma identifies various dusts as causing asthmatic response. Here the examples used: cyanide compounds, flour, wood dust, fumes, and smoke would not be expected to originate in the Allen Park Clay Mine landfill. Although metal fumes would be contained in buried dust, it is presumed that aggregation and maintenance cover would prevent wind carry of these dust off the property.

Further reference on p-65, to the toxicity of such pollutants as nitrogen dioxide, sulfur dioxide, coal, silica, and formaldehyde is irrelevant to any activities which take place in the landfill operation.

**Your Question #4:** "Could other industries be contributing to environmental contamination in this area?"

**Our Response:** Certainly many industries contribute to our local air pollution problems. Any industry which operates in this area, however, does so under strict emissions limits set by the Clean Air Act and fugitive dust control programs set by Wayne County.

**Your Question #5:** "Could air particulate matter (silt) that regularly accumulates on residential windows and cars in nearby areas be harmful to health?"

**Our Response:** Settleable dust causes soiling but by definition is not respirable and thus is not associated with the finer inhalable dust that is monitored by Wayne County required on-site sampling for suspended air pollutants (PM-10).

**Response:** ATSDR has included these comments as requested by the Wayne County Department of Public Health.

**Comment:** In page 10 of your report under "on-site contamination waste material," substances 1 through 9 are no doubt presence in the landfill. However, your general statement that "those waste materials typically contained inorganic chemicals" is true for some but not all of the dust itemized.

**Response:** ATSDR has incorporated this information into the public health assessment.

**Comment:** In most instances, your report was helpful in identifying the sources for its information. However, it would be helpful if on pages 44-46 of your report, the sources for information in Tables 3, 4, and 5 were also indicated.

**Response:** ATSDR did specify the sources for information in Tables 3, 4, and 5 under the heading "source" in the tables. The document correlating with the number listed under "source" can be found in the reference section of the public health assessment.

## ALLEN PARK CLAY MINE

### CONCERNS RELATED TO HEALTH OUTCOME DATA

**Comment:** The Snow Woods Area in Dearborn and the surrounding adjacent neighborhoods have not been adequately and fairly studied. We have been put (lumped) into a larger group of residents covering all of Wayne County. The communities surrounding the Clay Mine (DUMP) should have been grouped together for a more positive and accurate study. The method used diluted the survey of us.

**Response:** MCF studies and ATSDR investigation evaluated the Snow Woods area and other surrounding populations separately from the rest of Wayne County. MCF and ATSDR evaluated the combined communities around the site and compares them to the county excluding the those communities. Results of the study indicated that between 1973 and 1986, 2,519 cancer cases were diagnosed among residents of the three study areas. Based on the Dearborn comparative population, 2,638 cases were expected (number of cancer cases which should occur if the three study areas had the same cancer occurrence as the city of Dearborn), but the study area population had 5 percent fewer cancer cases. Cancer cases for the study area were 8 percent lower than the expected number (2,743) based on Wayne County cancer incidence rates.

**Comment:** We were concerned with all the cancer in our area.

**Response:** Between 1973 and 1986, the cancer incidence in these three areas were similar to the rest of Wayne county except for brain cancer in Snow Woods. Cancers evaluated by MCF included: the stomach, colon, rectum, liver, esophagus, small intestine, anus, gallbladder, pancreas, retroperitoneum, nasal cavity, larynx, lung and bronchus, trachea, bones and joints, soft tissues, prostate, testis, breast, cervix, ovary, vulva, kidney, ureter, other urinary system organs, eye, thyroid, melanomas, Hodgkin's Disease, non-Hodgkin's lymphomas, leukemia, and ill-defined cancer sites. Snow Woods experienced 22 cases of brain cancer over 18-year study period. ATSDR evaluation showed that only rates of brain cancer in the Snow Woods were elevated. There was a statistically significant excess occurrence of brain cancer in males and females (from 1973 to 1986) and of liver cancer in females (from 1973 to 1981) in the Snow Woods community of Dearborn. Recent information (1987 to 1990) on the number of brain and liver cancer cases in the Snow Woods community suggests that this excess brain cancer may have persisted throughout the period from 1973 to 1990. There are no completed human exposure pathways for the site, and the potential pathways of concern do not indicate the site contaminants are present at concentrations that may plausibly relate to an excess occurrence of brain cancer. Due to the small number of cases and lack of information on important risk factors of brain cancer

## ALLEN PARK CLAY MINE

(e.g., lifestyle, occupational exposure) there is no identified explanation to this excess.

**Comment:** In page 2, paragraph 2 the public should be advised at the outset, in clear language, that extensive studies have shown no increased rates of any type of cancer attributable to the site. While some types of cancer were higher than would be expected, others were lower, and the overall rate of cancer was lower than would be expected.

**Response:** On page 2, paragraph 2, ATSDR states that the increase in brain cancer occurrence could not be attributed to human exposure to contaminants from the site.

**Comment:** The last paragraph on this page implies that cancer rates and adverse reproductive outcomes are excessive in this population. This is conjecture and an inaccurate portrayal of observed conditions. The first sentence of this paragraph should be rewritten as follows:

Although the surveys could not establish definitive answers about whether cancers or adverse reproductive outcomes were excessive, they did ...

**Response:** ATSDR disagrees with the request. Rewriting the paragraph as stated above indicates that the survey was able to establish the definitive answers and failed to do so. The survey itself had limitations which did not allow it establish definite answers.

**Comment:** The third paragraph of this page should be changed to read as follows: ...in the Snow Woods community between 1973 and 1986, but a lower than expected number of cancers overall. Neither fact could be attributed to APCML.

**Response:** On page 23 ATSDR was explaining why the cancer evaluation was focused on brain cancer. The information in the above comment can be found on other pages of the APCM Public Health Assessment. For example, ATSDR stated on page 22 that between 1973 and 1986 residents of the three study areas (Snow Woods, Melvindale, and Allen Park) had lower than expected number of cases of cancer. On page 28 ATSDR stated that the excess incidence of brain cancer can not be attributed to the APCM.

**Comment - Table 12:** Although such anecdotal information is helpful, it can only be used as a qualitative tool inasmuch as such surveys were not objectively conducted by trained individuals. Any such results must not be construed as based on science.

## ALLEN PARK CLAY MINE

**Response:** ATSDR agrees that this self-reported survey is useful primarily as a qualitative tool. ATSDR public health assessments include and evaluate all community health concerns, including self-reported surveys.

**Comment:** Overall, the report does not link chemical constituents at the site with any adverse human health effect that could potentially have occurred or may occur in the neighboring community.

**Response:** In the absence of any off site monitoring data, it is impossible to make any categorical statement regarding the potential exposure of off-site residents to any specific environmental contaminants in the past, present, or future. However, several conditions make it unlikely that the residents of Snow Woods, Melvindale, and Allen Park have been or will be significantly exposed to any contaminants from the APCM site in particular:

- (1) Nearby communities (including snow woods) are physically separated from APCM by divided highways, and access to the site is effectively limited.
- (2) Hydrogeologic conditions make it difficult for contaminants from the site to migrate into the deep aquifer and, thence, off-site. Furthermore, that water is apparently not potable without treatment, and there is no evidence that it has ever been consumed.
- (3) The direction of the prevailing winds, which are from the southwest, should limit potential exposure to fugitive dusts and gases in the communities of Snow Woods, Melvindale and, especially, Allen Park. Based on the levels measured on-site, any airborne contaminants that might reach off-site communities from the APCM site would most likely be diluted well below concentrations of health concern.
- (4) Levels of contaminants in stormwater runoff at the APCM site are not of public health concern, and would be even lower after reaching off-site areas where playing children might be exposed.
- (5) Permit requirements and pollution abatement practices at the site should further reduce the likelihood of any exposures of health concern taking place in the future.

Finally, even if one is exposed to an environmental contaminant, a given adverse health effect cannot be attributed to that exposure unless the particular agent is capable of producing the particular effect. For example, several agents (e.g., N-nitroso compounds, acrylamide, and the Rous sarcoma virus) have been shown to induce brain cancer in laboratory animals, but none of the contaminants of concern at the APCM site is currently known to have this ability.

## ALLEN PARK CLAY MINE

**Comment:** The report should point out that the Snow Woods area of the City of Dearborn, where elevated brain cancer rates are observed, is predominately upwind of the site and therefore at the least potential risk of exposure via the "most likely" potential exposure pathway, e.g., fugitive (airborne) dust emissions. It is noteworthy that none of the other three communities, especially Melvindale (which is situated most downwind of the site) had an elevated rate of brain cancer based on the available data.

**Response:** Although the prevailing wind direction is from the southwest, the Snow Woods community could still be impacted by airborne contaminants from the APCM landfill. The Snow Woods community is located within one-quarter mile of the site and, on days with calm winds, airborne contaminants from the site could reach the community. In addition, although wind blows away from Snow Woods (toward APCM) most of the time, wind does occasionally blow toward Snow Woods from the site. ATSDR does recognize, however, that factors other than the proximity to APCM may be related to the excess of brain cancer in Snow Woods. The ATSDR Health Activities Recommendation Panel recommended a health statistics review and a community health investigation to further evaluate the elevation of brain cancer rates in Snow Woods.

**Comment:** While there is not a clear enumeration of the cases in terms of age grouped, the description of the case series for Snow Woods on page 23 of the report suggested that the cases were adults. If this is the case, the other potential exposures (storm water runoff, leachate, and sediments) could actually be considered eliminated pathways for the brain cancer cases. Each of the descriptions of the potential pathways for exposure were suggested as pathways for children who might play in the soil, mud or water of the drainage areas adjacent to the site. If there is no plausible exposure, it is not possible to conduct a valid health effects study.

**Response:** The cancer cases in Snow Woods included both children and adults.

**Comment:** In comparing this study to others, it has been determined that this is not a health study. Rather it is a risk assessment. The risk of opening the APCM to toxic waste has been studied, not the health of residents living in the area. A house-to-house health assessment must be completed before this study could be considered anything but questionable.

**Response:** An ATSDR public health assessment is not a health study or a risk assessment. However, the epidemiological study may be one of the recommendations made by the public health assessment. Such epidemiological studies are based on the environmental and public health evaluation done in the public health assessment. A house-to-house survey is one form of epidemiological study.

## ALLEN PARK CLAY MINE

**Comment:** Melvindale and Allen Park need to be included in further health assessments. Snow Woods is not the only area directly affected by wind direction.

**Response:** Brain cancer incidence and rates from selected census tracts of Melvindale, Allen Park and Dearborn Heights were considered, in addition to the Snow Woods neighborhood, as part of the current APCM Public Health Assessment. These same communities will be included in data collection and analysis to be conducted by the Michigan Department of Public Health.

**Comment:** Comments have urged an immediate and comprehensive study of potential causes for the excessive incidence of brain cancer in the Snow Woods area. In particular, ATSDR has been urged to "make the necessary provisions to secure funding and to conduct its follow-up study (community health investigation and health statistics review) as soon as possible".

**Comment:** A further health study has been requested to determine if Snow Woods residents are at risk solely due to their proximity to the APCM, or because of some other combination of factors that may be identified.

**Comment:** ATSDR has recommended further action of its own in the study. When will this be completed? Who will complete the study? When will the tests be ordered?

**Comment:** As poorly designed as this study is, the figures still show a high incidence of brain cancer in the Snow Woods area. The study, itself, suggests that further assessments must be done.

**Comment:** ATSDR's study show a high incidence of brain cancer in the areas surrounding the APCM. Studies must be done to extrapolate data so that this anomaly can be tracked.

**Comment:** A door-to-door health assessment must be done for the entire area surrounding the APCM to include Melvindale and Allen Park, as well as the Snow Woods area of Dearborn.

**Response above 6 comments:** The Public Health Action Plan on page 30 has been amended to show that the Michigan Department of Public Health (MDPH) will be conducting data collection and analysis regarding the most currently available listing of brain cancer cases identified in the communities surrounding the Allen Park Clay Mine site during the period of 1973 to present. These activities will include administration of a questionnaire survey pertaining to each documented case of brain cancer, where possible, in the Snow Woods neighborhood and selected census tracts of Melvindale, Allen Park and Dearborn Heights. Geographic Information System (GIS) technology will be utilized in evaluating possible relationships to potential environmental, occupational and behavioral risk factors, including spatial relationships to the site. The findings will be reported in an addendum to this Public Health Assessment.

## ALLEN PARK CLAY MINE

**Comment:** We are pleased that your report shows no demonstrable link between local cancer or other disease rates and any discharge or emissions from the landfill operated at the Allen Park Clay Mine site. After three years of study, your agency has concluded that "there is no evidence that people have been exposed to hazardous substances at concentrations likely to cause adverse health effects."

**Response:** This comment included as requested.

**Comment:** We are surprised to learn that after three years of study, your agency's Health Activities Recommendation Panel (HARP) has determined that a community health investigation and health statistic review is indicated due to a previously well-documented excess incidence of brain cancer in the Snow Woods area. This recommendation was made despite the fact that this increase was seen only from 1973-1981 in the Snow Woods area and not in Allen Park or Melvindale, two communities also bordering the landfill. Furthermore, according to the Michigan Cancer Foundation reports, the incidence of these cancers in the Snow Woods area has declined over time and no longer occurs at rates significantly elevated over those of comparison populations that are similar to the Snow Woods population, but do not reside near a landfill. Your report also states that "implementation of the proposal for a community health investigation will depend on the availability of funds and a state-affiliated agency to conduct the investigation." This statement needs further clarification. Given the limited resources in our State, we think it makes sense to focus our disease prevention efforts primarily in areas where disease indicators are increasing or have remained constantly elevated.

**Response:** The increase in the brain cancer rates in Snow Woods was high during the period from 1973 through 1990. The entire period of time should be considered to calculate cancer rates. In addition, it is essential to consider the same period of time to calculate cancer rates of all cancer sites. If the trends of cancer rates during any shorter period of time are to be considered, that should be done for all cancer types simultaneously. The Michigan Department of Public Health (MDPH), through an amendment to its cooperative agreement with ATSDR, will conduct data collection and analysis on the most currently available listing of brain cancer cases identified in the communities surrounding the Allen Park Clay Mine during the period of 1973 to the present.

\* Note: In general, the public comments were taken directly from letters written to ATSDR.

1996

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION V**

**DATE:**

**SUBJECT:** Review of Draft Preliminary Health Assessment

**FROM:** Karl E. Bremer, Chief  
RCRA Permitting Branch

**TO:** Louise Fabinski  
ATSDR Regional Representative

As requested, the Draft Preliminary Health Assessment for the Allen Park Clay Mine has been reviewed by my staff. Both technical and nontechnical comments are provided below. If you have any questions regarding this review, please contact Shari Kolak of my staff at, 886-6151.

1. In regard to the second paragraph on page 1: The Federal Hazardous and Solid Waste Amendments (HSWA) permit and the State Act 64 Operating License was jointly issued on May 8, 1989. In contrast to the Act 64 Operating License, the HSWA permit did not become effective until June 8, 1989. Please note that the RCRA permit is effective when the Federal permit and State Operating License are effective.
2. In regard to the third paragraph on page 4: The facility operated under interim status until the State Act 64 Operating License and the Federal HSWA permit became effective.
3. The first sentence in the fourth paragraph on page 3, should be amended to read "Hazardous wastes continued to be disposed of in Cell I until 1985."
4. The facility address is incorrectly reported on page 3. The correct address is 17005 Oakwood Boulevard.
5. The section labeled "Environmental Contamination and Other Hazards" on page 9, contains a typographical error. In the first paragraph, a bullet mark is missing from the fourth criteria. Also, the sentence describing waste materials on page 10, should be amended to include the chemical phenol. This sentence should read "Those waste materials typically contained inorganic chemicals (e.g., cadmium, chromium, and lead) and organic compounds (e.g., naphthalene and phenol)."
6. Several definitions on page 51, in Appendix C should be modified to provide better clarification. The definition of Maximum Contaminant Levels should read "Maximum Contaminant Levels (MCLs) are maximum permissible contaminant concentrations in drinking water that the EPA believes will protect public health (considering the availability and economics of water treatment technology) over a lifetime (70 years) at an exposure rate of 2 liters per day (for an adult)." In addition, the

definition of Reference Dose should read "EPA's Reference Dose (RfD) is an estimate of a lifetime daily exposure to a contaminant that is unlikely to cause adverse (noncancer) health effects."

7. The footnote #1 in Table 4 on page 43, Appendix B, contains a typographical error. The footnote should read "See Appendix C for definitions."

"U.S. EPA's Reference Dose (RfD) is an estimate of a lifetime daily exposure to a contaminant that is unlikely to cause adverse (noncancer) health effects."

7. The footnote #1 in Table 4 on page 43, Appendix B, contains a typographical error. The footnote should read "See Appendix C for definitions."

WMD\OR\RPB\MI SECTION\slk-nl\01-05-93\Shari's disk\B:ATSDR.LTR

NL 1/5/93 1/13/93

SIGNATURE/INITIAL CONCURRENCE REQUESTED - RCRA PERMITTING BRANCH (RPB)										
TYPIS	AUTH.	ILS CHIEF	INS CHIEF	MIS CHIEF	MN/WI CHIEF	OHS CHIEF	SWS CHIEF	RPB CHIEF	RCRA ASOC.DR	WASTE MGMT. DIV.DIRECTOR
SK 1/5/93 NL 1/5	SLK 1/5/93			RCR 1/7/93				K.B. 1/13/93		





DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Agency for Toxic Substances  
and Disease Registry  
Atlanta GA 30333

March 2, 1993

RECEIVED

MAR 5 1993

OFFICE OF RCRA  
Waste Management Division  
U.S. EPA, REGION V

Mr. Karl E. Bremer  
Chief  
RCRA Permitting Branch  
U.S. Environmental Protection Agency  
Region V  
77 West Jackson Boulevard  
Chicago, Illinois 60604

Dear Mr. Bremer:

Enclosed please find a copy of the Agency for Toxic Substances and Disease Registry (ATSDR) Petitioned Public Health Assessment-Public Comment Release for the Allen Park Clay Mine Site, dated March 2, 1993. This document is ATSDR's evaluation of data and information on the release of contaminants into the environment from the Allen Park Clay Mine Site, Allen Park, Wayne County, Michigan. The purpose of this document is to assess any current or future impact on public health.

The ATSDR will accept written comments from the public until May 6, 1993. Comments should be addressed to:  
Ms. Lydia Odgen Askew, Community Involvement Liaison, Division of Health Assessment and Consultation, ATSDR, Mailstop E-32, 1600 Clifton Road, N.E., Atlanta, Georgia 30333.

If you have any questions, please do not hesitate to call Ms. Ogden Askew, at (404) 330-9543 (24-hour message service).

Sincerely yours,

*Margaret Stone*  
for  
Max M. Howie, Jr.  
Chief

Records and Information Management Branch  
Division of Health Assessment  
and Consultation

Enclosure

document  
in file

7/1/96



## **Public Notice Allen Park, Michigan**

The Agency for Toxic Substances and Disease Registry Public Health Assessment for the Allen Park Clay Mine will be available on March 8 at the following repositories:

Bryant Public Library, 22100 Michigan Ave., Dearborn  
Henry Ford Centennial Library, 16301 Michigan Ave., Dearborn  
Melvindale Public Library, 18650 Allen Rd., Melvindale  
Allen Park Public Library, 8100 Allen Rd., Allen Park

The 60-day Public Comment Period will run March 8-May 6, 1993. Comments postmarked after that time will not be considered for this revision of the document. Comments received during the public comment period will be logged and become part of the administrative record for the Public Health Assessment. Comments and responses will be included in an appendix to the final Public Health Assessment. Commenters' names will not be included in the Public Health Assessment, however, they are subject to Freedom of Information Act requests. For that reason, individuals should exercise their own judgment concerning the inclusion of any personal health information or other confidential data in comments sent to ATSDR. Only written comments will be accepted. Comments should be directed to:

Lydia Ogden Askew  
Community Involvement Liaison  
ATSDR (E32)  
1600 Clifton Road, NE  
Atlanta, GA 30333

If sufficient public comments are received, a public meeting may be held. Please contact Louise Fabinski at 312/886-0840 or Ms. Ogden Askew at 404/302-2620 (24 hours) if you have questions.

To run in:  
News Herald 313/246-0800  
Dearborn Times 313/584-4000



# **Public Health Assessments**

## **What is ATSDR?**

ATSDR is the Agency for Toxic Substances and Disease Registry, a federal public health agency. ATSDR is part of the Public Health Service within the U.S. Department of Health and Human Services. Created by Superfund legislation in 1980, ATSDR's mission is to prevent or mitigate adverse human health effects and diminished quality of life resulting from exposure to hazardous substances in the environment.



## **What is a Public Health Assessment?**

An ATSDR Public Health Assessment gathers information about hazardous substances at a site and evaluates whether exposure to those substances might cause any harm to people. Public Health Assessments consider --

- o what the levels (or "concentrations") of chemicals are at the site
- o whether people on or near the site might be exposed to the substances and how (through "exposure pathways" such as breathing air, drinking or contacting water, contacting or eating soil, or eating contaminated food)
- o what harm the substances at the site might cause to people (or the chemicals' "toxicity")
- o whether working or living near the site might affect people's health

To make those determinations, ATSDR looks at three primary sources of information --

- o **environmental data**, such as information on the chemicals at the site and how people could come in contact with the chemicals.
- o **health data**, including information on community-wide rates of illness, disease, and death compared with national and state rates.
- o **community concerns**, such as citizen reports about how the site affects their health or quality of life.

## **How Are Public Health Assessments Used?**

Public Health Assessments advise the U.S. Environmental Protection Agency and states on actions to reduce or prevent people's exposure to hazardous substances. They are used to develop Public Health Advisories and other recommendations to protect the public's health. They are also used to identify health studies or other actions -- such as environmental health education for the community and its health care providers -- that might be needed.



## What Is the Community's Role in a Public Health Assessment?

The community has a key role to play in a Public Health Assessment and any activity that may follow. Throughout the Public Health Assessment, ATSDR talks with people living near the site--citizen groups, local leaders, and health professionals, among other community members--about their knowledge of the site and their health concerns related to the site. Health concerns are addressed in every Public Health Assessment for every site.

***Two-way communication between the public and ATSDR is vital to a successful Public Health Assessment.*** For that reason, ATSDR has several mechanisms to keep the public involved and informed and to solicit information from the community, such as --

- o Public Availability Meetings where community members can meet individually with ATSDR staff.
- o Public Meetings during which community members can express ideas in a larger forum.
- o Community Advisory Panels, which work to inform ATSDR about community concerns and health information and, in turn, to inform the community about ATSDR activities and the status of the Public Health Assessment.
- o Other communication channels, such as contact with local citizen groups, political leaders, and health professionals, as well as articles in local newspapers and on television and radio stations.
- o Before the Public Health Assessment is complete, it is available in the community during the Public Comment Period. The Public Comment Period gives the community the opportunity to tell ATSDR how well the Public Health Assessment addresses concerns. To provide information back to the community, ATSDR responds to public comments in the final Public Health Assessment.

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### To Get More Information

Call or write:

Lydia Ogden Askew  
Community Involvement Liaison  
ATSDR-Division of Health Assessment and Consultation  
1600 Clifton Road, NE (E32)  
Atlanta, Georgia 30333  
404/639-0609 (during the workday)  
404/330-9543 (24 hours)

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# Health Assessment for

## PETITIONED PUBLIC HEALTH ASSESSMENT

ALLEN PARK CLAY MINE

ALLEN PARK, WAYNE COUNTY, MICHIGAN

CERCLIS NO. MID980568711

MARCH 2, 1993

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
PUBLIC HEALTH SERVICE

Agency for Toxic Substances and Disease Registry

Comment Period Ends :

MAY 6, 1993

711-16

## THE ATSDR HEALTH ASSESSMENT: A NOTE OF EXPLANATION

Section 104 (i) (7) (A) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, states "...the term 'health assessment' shall include preliminary assessments of potential risks to human health posed by individual sites and facilities, based on such factors as the nature and extent of contamination, the existence of potential pathways of human exposure (including ground or surface water contamination, air emissions, and food chain contamination), the size and potential susceptibility of the community within the likely pathways of exposure, the comparison of expected human exposure levels to the short-term and long-term health effects associated with identified hazardous substances and any available recommended exposure or tolerance limits for such hazardous substances, and the comparison of existing morbidity and mortality data on diseases that may be associated with the observed levels of exposure. The Administrator of ATSDR shall use appropriate data, risks assessments, risk evaluations and studies available from the Administrator of EPA."

In accordance with the CERCLA section cited, this Health Assessment has been conducted using available data. Additional Health Assessments may be conducted for this site as more information becomes available.

The conclusions and recommendations presented in this Health Assessment are the result of site specific analyses and are not to be cited or quoted for other evaluations or Health Assessments.

Use of trade names is for identification only and does not constitute endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

ALLEN PARK CLAY MINE

PUBLIC COMMENT RELEASE

PETITIONED PUBLIC HEALTH ASSESSMENT

ALLEN PARK CLAY MINE

ALLEN PARK, WAYNE COUNTY, MICHIGAN

CERCLIS NO. MID980568711

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
PUBLIC HEALTH SERVICE  
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY  
DIVISION OF HEALTH ASSESSMENT AND CONSULTATION  
ATLANTA, GEORGIA



## THE ATSDR PUBLIC HEALTH ASSESSMENT: A NOTE OF EXPLANATION

This Public Health Assessment-Public Comment Release was prepared by ATSDR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) section 104 (i)(6) (42 U.S.C. 9604 (i)(6), and in accordance with our implementing regulations 42 C.F.R. Part 90). In preparing this document, ATSDR has collected relevant health data, environmental data, and community health concerns from the Environmental Protection Agency (EPA), state and local health and environmental agencies, the community, and potentially responsible parties, where appropriate. This document represents the Agency's best efforts, based on currently available information, to fulfill the statutory criteria set out in CERCLA section 104 (i)(6) within a limited timeframe. To the extent possible, it presents an assessment of the potential risks to human health. Actions authorized by CERCLA section 104 (i)(11), or otherwise authorized by CERCLA, may be undertaken to prevent or mitigate human exposure or risks to human health. In addition, ATSDR will utilize this document to determine if follow-up health actions are appropriate at this time.

This document has been provided to EPA and the affected state in an initial release, as required by CERCLA section 104 (i)(6)(H) for their information and review. Where necessary, it has been revised in response to comments or additional relevant information provided by them to ATSDR. This revised document has now been released for a 30 day public comment period. Subsequent to the public comment period, ATSDR will address all public comments and revise or append the document as appropriate. The public health assessment will then be reissued. This will conclude the public health assessment process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

Comments regarding this report are welcome. Please address to:

Agency for Toxic Substances and Disease Registry  
Attn: Director, Division of Health Assessment and Consultation (E-32)  
1600 Clifton Road, N.E., Atlanta, Georgia 30333

*Agency for Toxic Substances*

*and Disease Registry.....William L. Roper, M.D., M.P.H. Administrator*  
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**SUMMARY**

The Allen Park Clay Mine (APCM) landfill is in Wayne County, Michigan, within the city limits of Allen Park. The APCM site is owned and operated by the Ford Motor Company. The site is bordered on the south by Allen Park, on the east by Melvindale, and on the west by the Snow Woods area of the City of Dearborn. Those residential areas are separated from the APCM site by 6- to 8-lane highways. The Ford Motor Company Rouge River Plant lies a quarter mile to the north of the site.

The Ford Motor Company developed a clay mine on the site before 1956. Since 1956, the clay excavations have been backfilled with wastes from the Ford Motor Company Rouge River Plant. Some of the wastes (i.e., electric arc furnace dust and decanter tank tar sludge) are classified by the U.S. Environmental Protection Agency as hazardous. Beginning in November 1980, those hazardous wastes were separately deposited at the site in a designated hazardous waste management area called Cell I. In 1986, Cell I was closed, and a leachate collection system and clay cap were installed. State and federal permits for operation of a hazardous waste disposal cell (Cell II) became effective in June 1989. Currently, the cell does not receive wastes; it will probably begin operating in the summer of 1993.

Area residents have expressed a variety of concerns about the APCM facility. They worry that wastes disposed of at the site might cause illness, particularly cancer, in their community. Concerns have also been raised that dusts generated by site activities might cause illness, and that existing illnesses might become worse as a result of the site. Because of those concerns, two petitions to conduct a public health assessment of the Allen Park Clay Mine site were submitted to the Agency for Toxic Substances and Disease Registry (ATSDR).

Contaminants, including metals and polycyclic aromatic hydrocarbons (PAHs), have been identified in on-site groundwater, storm water runoff, and sediments. ATSDR could not determine if these contaminants were released from the APCM site. Metals have also been found in on-site air. No completed exposure pathways (ways for contaminants to reach the public) have been identified; however, potential exposure pathways do exist. Residents living near the site could be exposed to contaminants in the air. Children playing in the Allen and Tyre storm water drains which run through the community of Melvindale also could be exposed to contaminants in storm water runoff and sediments. Contaminants found in on-site storm water runoff and sediments, however, have not been at levels likely to cause illness and disease through intermittent exposure. In the past, contact with contaminants in the leachate was possible through the Allen



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and Tyre drains. Installation of leachate collection systems has eliminated that exposure pathway. Finally, although there are contaminants at levels of health concern in groundwater, no uses of that groundwater have been identified.

Residents expressed concerns that the communities surrounding the site may have a high rate of cancer. Health outcome data for the nearby areas indicate that, from 1973 to 1990, there has been an excess occurrence of brain cancer in the Snow Woods community of Dearborn. However, that increase in cancer occurrence could not be attributed to human exposures to contaminants from the site.

From available information, ATSDR has concluded that the APCM site is an indeterminate public health hazard. There is no evidence that people have been exposed to hazardous substances at concentrations likely to cause adverse health effects. However, ATSDR has identified data gaps that limit ATSDR's ability to fully evaluate the site. According to the facility's operating license, air monitoring will be conducted when the new hazardous waste disposal cell begins receiving waste. ATSDR recommends review of this air data to ensure that particulate and contaminant concentrations are at levels that will not endanger public health. ATSDR also recommends that off-site groundwater be monitored, or steps be taken to ensure that the groundwater is not used in the future unless treated.

ATSDR's Health Activities Recommendation Panel (HARP) has reviewed the APCM site to determine if any follow-up health activities are indicated. Because of the elevation of brain cancer incidence rates, the panel determined that a community health investigation and health statistics review is indicated. ATSDR will also evaluate any new data or information it receives about this site to determine if additional public health actions are appropriate.



## BACKGROUND

### A. Site Description and History

The Allen Park Clay Mine (APCM) site covers 260 acres, approximately 8 miles southwest of downtown Detroit, at 17005 Oakwood Boulevard, Allen Park, Wayne County, Michigan. The location of the site is shown in Figure 1 (all figures are in Appendix A). The landfill is bordered on the south by Allen Park, on the east by Melvindale, and on the west by the Snow Woods area of the City of Dearborn. Although the site is bordered by residential areas on all but the northern side, it is separated from the residential areas by 6- to 8-lane highways. The Ford Motor Company Rouge River Plant is in the industrial area bordering the northern part of the site. The Rouge River lies about 1 mile north of the APCM site.

The 260-acre APCM site consists of 17 acres of hazardous waste landfill (Cell I and Cell II) and 149 acres of a solid waste landfill (called the old landfill unit) that received wastes before the Resource Conservation and Recovery Act (RCRA) was enacted. The site also includes 9 acres of nonhazardous solid waste landfill (Cell III), which received wastes from 1985 to 1989; 25 acres of nonhazardous waste landfill (Cell IV), which was granted a Michigan Act 651 solid waste disposal license in October 1992 and is now accepting non-hazardous solid waste; 33 acres of buffer zone between off-site areas and the landfill, and 27 acres used as easements (1,2).

The APCM site was originally mined for clay to be used in the cement industry. Since 1956, the clay excavations have been backfilled by wastes generated at the nearby Ford Rouge River Plant. A small part of the wastes (i.e., electric arc furnace dust and decanter tank tar sludge) are classified by the U.S. Environmental Protection Agency (EPA) as hazardous. After 1980, in accordance with RCRA legislation, hazardous wastes (including electric arc furnace dust and coke tar sludge) were segregated and separately deposited in a designated hazardous waste management area (Cell I) (3).

Hazardous wastes continued to be disposed of in Cell I until 1985. That cell, which consisted of an 8-acre excavation extending to a depth of 35 feet below grade, was closed in 1986. Closing of Cell I included the following: 1) installation of a leachate collection system; 2) coverage (capping) with a synthetic liner and clay; 3) installation of a drainage layer in the cap; and 4) grading and planting of a vegetation cover over the capped area (3).

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A number of improvements have been made at the APCM site. In 1980, projects were initiated to control leachate migration and surface water run-on and runoff. Those projects included installing a system of french drains and a surface water drainage system around the site's perimeter, a perimeter dike system, an interior dike system, and monitoring wells. Those site improvement projects were completed by 1982 (3).

Additional site improvements were made in 1987, including installation of a leachate collection system in the old landfill unit, which had received waste between 1956 and 1985. That was necessary because of buildup of leachate within the landfill. The new collection system discharges leachate into the sanitary sewer (3).

Disposal activities at the APCM site were at first regulated in accordance with a permit issued by Ecorse Township in 1956. Since that time, waste disposal activities at the APCM site have been regulated by the State of Michigan through its hazardous waste disposal legislation -- the Michigan Public Act 87 (1965), as amended by Act 89 in 1971, and by Act 641 in 1979. The facility operated under interim status until a Michigan Public Act 64 license and a Federal HSWA permit became effective in June 1989; a Resource Conservation and Recovery Act (RCRA) permit became effective in June 1989 (3). That permit approved operation of a hazardous waste disposal cell (Cell II). Currently, that cell is not receiving wastes; it will probably begin operating in the summer of 1993.

Residents living near the APCM site expressed concerns to their local officials about health hazards potentially associated with the site. Because of those community concerns, two petitions for a public health assessment of the site were submitted to ATSDR. The first was submitted on December 21, 1988, by the Mayor of Melvindale, Michigan; the second petition was submitted on January 5, 1989, by the City Council of Dearborn, Michigan.

### B. Site Visits

On May 25, 1989, the Agency for Toxic Substances and Disease Registry (ATSDR) staff conducted a site visit at APCM. During the visit, observations were made about on- and off-site conditions, including land use in areas on site and adjacent to the site; the ease of site access; the proximity of residential areas; the presence of on-site physical hazards; and the general physical characteristics of on- and off-site areas.

Access to the site is restricted by an 8-foot, chain link fence surrounding the site. Site access is also somewhat restricted by the 6- to 8-lane highways surrounding

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the site on the western, southern, and eastern sides. The northern side of the site is bordered by a 3-lane road. Security at the site is maintained by security officers, who patrol the site 24 hours a day.

Inactive parts of the site, particularly the closed and capped hazardous waste area (Cell I), are covered with vegetation, primarily grasses. Ongoing soil excavation and other construction activities are taking place on non-vegetated parts of the site.

On February 11, 1991, ATSDR staff made a second visit to the Allen Park Clay Mine site to obtain additional information about the site conditions and operations. ATSDR staff also held a public availability session about the Allen Park Clay Mine site at the City Hall of Dearborn, Michigan. Representatives from the Michigan Department of Public Health (MDPH) and the Michigan Department of Natural Resources (MDNR) assisted ATSDR in conducting the session. The public availability session provided an opportunity for ATSDR staff to meet with members of the local community in order to discuss ATSDR plans for a public health assessment of the site, and to obtain information on community health concerns related to the site. Information about community health concerns is provided in the Community Health Concerns section of this public health assessment.

### **C. Demographics, Land Use, and Natural Resource Use**

#### **Demographics**

The Allen Park Clay Mine site is in the Detroit metropolitan area, approximately 8 miles southwest of downtown Detroit. The site is in a northern section of the City of Allen Park and borders Dearborn to the northwest and Melvindale to the southeast. Population and housing data for the census tract containing the site and for surrounding census tracts (which comprise parts of the cities of Allen Park, Dearborn, and Melvindale) are found in Tables 1 and 2 (all tables are in Appendix B).

Residential areas are in the census tract that contains Allen Park Clay Mine. Those residential areas are southwest of the site. The 1990 population of the tract was 2,270; nearly 91% of the population was white. Only 8.6% were under age 10; 20.6% were age 65 or older. Those figures suggest the presence of large numbers of retirees, possibly including some long-term-care patients at the Veterans Administration Hospital in Dearborn. There were a total of 827 households in this tract (average of 2.74 persons per household). Nearly 75% of housing units were owner occupied; that relatively high percentage indicates a nontransient population.

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One of the petitioners for the public health assessment was the Mayor of Melvindale. Melvindale had a 1990 population of 11,235, which was a decline of 8.8% from the 1980 population of more than 12,300. In 1990, approximately 93.6% of Melvindale residents were white. Thirteen percent of the population were under age 10; 14.1% were age 65 or older. Approximately two thirds of occupied housing units in Melvindale were owner occupied, again indicating a nontransient population. The 1990 median value of owner-occupied housing units was approximately \$38,000; median monthly rent paid by renters was \$342; those figures are extremely low, particularly for a community in a major metropolitan area.

A census tract south of the site contains part of the City of Allen Park. That tract had a 1990 population of 6,709; 98% were white. More than 20 percent were age 65 or older. Nearly 90 percent of households were owner occupied; the median value of owner occupied units was just under \$57,000.

Two census tracts that are part of the City of Dearborn are west of the site. Those tracts had a total 1990 population of 6,215. As in the other areas, nearly all residents were white. More than 20% were age 65 or older. More than 94% of the 2,459 households were owner occupied. Median value of homes was approximately \$75,000.

### **Land Use**

Institutional land use near the site includes the Veterans Administration Hospital immediately southwest of the site and a number of elementary and secondary schools within 1 mile of the site (5).

Except for home gardens, there is no agricultural land use within 1 mile of the site. Recreational land use in the site vicinity includes the Rouge River Park, which is about one-half mile to the north (5).

Located near the APCM site are numerous industrial facilities, including the Ford Rouge River Plant about a quarter mile north of the site. Other industrial areas are within 1 mile northwest, south, and east of the site. An especially large industrial area of more than 500 acres is 1.25 miles northeast of the site.

### **Natural Resources**

Two aquifers, called shallow and deep, are in the site vicinity. The uppermost part of the shallow aquifer generally lies within 10 feet of the ground surface. The deep aquifer is approximately 70 feet below the ground surface in the site area.

Groundwater from the deep aquifer is highly mineralized. According to staff from the Wayne County Department of Public Health and the Michigan Department of Natural Resources, there are no known water wells within 1 mile of the site. Water for residences and commercial users in the site vicinity is provided by the City of Detroit (5,6,7).

The subsurface soil profile at the APCM site consists of upper sands from 3 to 7 feet thick, replaced by fill in some areas. That layer is underlain by a silty clay layer from 65 to 70 feet thick; it in turn overlies the lower sand layer, which ranges in thickness from 3 to 6 feet or more. Groundwater in the lower sands is under artesian pressure, with piezometric levels at or above the ground surface. Those conditions indicate a confined aquifer with an upward hydraulic flow gradient. In other words, the groundwater attempts to flow from the lower sand upward through the clay deposit to the upper sand (5,6).

Storm water runoff from the APCM site enters the Allen and Tyre storm water drains. These drains originate on site and then exit to the east. They run through residential areas of Melvindale before combining into one drain (called Allen drain) which discharges into the Rouge River. The Rouge River lies about one mile north of the APCM site.

#### **D. Health Outcome Data**

Using local and state health databases, it may be possible to determine whether certain health effects are higher than expected in the APCM area. This section identifies the relevant, available databases; they are evaluated in the Public Health Implications section of this public health assessment.

Two surveys were conducted in 1989 and 1990 by residents of the Snow Woods community. Those surveys included self-reporting of health problems.

ATSDR searched for data pertaining to mortality (death) and respiratory diseases surrounding the site. Mortality data are not complete because the population estimates for the minor civil divisions in Wayne County that match the death records are not available. Respiratory disease data in communities surrounding the site do not appear to exist, even on the county level.

Two descriptive studies of cancer incidence (cases of newly diagnosed cancer occurring during a specified period) for communities surrounding the site were completed in 1983 and 1989 by the Michigan Cancer Foundation (MCF), Division of Epidemiology (8,9). Health outcome data used in those analyses were obtained from the Metropolitan Detroit Cancer Surveillance System (MDCSS), a cancer

registry sponsored by the Surveillance, Epidemiology and End Results (SEER) Program, National Cancer Institute, U.S. Public Health Service.

As part of this public health assessment, ATSDR analyzed the incidence of brain and liver cancers in communities surrounding the APCM site. The data (new cancer cases first diagnosed between 1973 and 1989) were obtained from the MCF Division of Epidemiology.

A review of the previously described surveys, studies, and analyses is contained in the Public Health Implications section of this public health assessment.

### **COMMUNITY HEALTH CONCERNS**

ATSDR believes identifying and addressing community health concerns relevant to a particular site are critically important to the public health assessment. This section identifies community concerns associated with the APCM site. ATSDR responds to the concerns in the Public Health Implications section of this document.

Community health concerns related to the Allen Park Clay Mine site were expressed by the petitioners and by area residents who attended a public availability meeting for the site in February 1991. In addition, community health concerns were collected from state and local authorities. Community health concerns are summarized as follows:

1. Is the incidence of cancer (including prostate, brain, bladder, colon, and bone cancers, and leukemia) in the Snow Woods, Melvindale, and Allen Park communities higher than in other parts of Michigan?
2. Are the incidences of adverse health outcomes (death, asthma, allergies, emphysema, cirrhosis of the liver, congenital heart defects, and hepatitis) in Snow Woods, Melvindale, and Allen Park higher than in other parts of Michigan?
3. How will local residents with preexisting adverse health conditions (such as asthma) be affected by this landfill?
4. Could other industries be contributing to environmental contamination in the area?

5. Could air particulate matter (silt) that regularly accumulates on residential windows and cars in nearby areas be harmful to health?

Local residents have also expressed concerns that clay adhering to the tires of trucks leaving the site was being scattered along Oakwood Boulevard which runs through areas of Allen Park, Dearborn, and Melvindale. In response to those concerns, Ford Motor Company installed an on-site tire wash facility. That action appears to have alleviated the concerns.

Area residents have also expressed concern about the possibility of decreasing property values because of the presence of a landfill in the area. Because that concern is not related to public health, but to economics, ATSDR cannot address it in this public health assessment.

### **ENVIRONMENTAL CONTAMINATION AND OTHER HAZARDS**

The tables in Appendix B list the contaminants identified in each environmental medium at the site. The contaminants are evaluated in subsequent sections of this public health assessment to determine whether exposure to them has public health significance. ATSDR selects and discusses contaminants using several types of information, including these:

- concentrations on and off site;
- the quality of field and laboratory data and sample design;
- comparison of on- and off-site concentrations to health assessment comparison values for cancer and noncancer endpoints; and
- community health concerns.

Because a contaminant is listed in the tables does not mean it will cause adverse health effects if exposure occurs at specified concentrations. Rather, the list indicates which contaminants will be further evaluated in this public health assessment. The potential for adverse health effects resulting from exposure to contaminants of health concern is discussed in the Public Health Implications section.

Comparison values used in ATSDR public health assessments are contaminant concentrations in specific media (e.g. air, soil, groundwater) used to select contaminants for further evaluation. ATSDR and other agencies developed those values to provide guidelines for estimating the media concentrations of a contaminant that are unlikely to cause adverse health effects, given a standard

daily ingestion rate and standard body weight. See Appendix C for a description of the comparison values used in this public health assessment.

## A. On-Site Contamination

### Waste Material

Surface and subsurface soil have not been sampled at the site, and limited information is available to define waste types and concentrations in subsurface waste cells. However, the Michigan Department of Natural Resources (DNR) compiled a summary of waste descriptions for materials disposed of or suspected to have been disposed of in the landfill before 1982 and identified the following sources for those waste materials:

1. fly ash - recovered from waste gases of power stations burning pulverized coal;
2. decanter tank tar sludge - from cooling coke oven gases;
3. coke tar sludge and breeze (fine screening from crushed coke);
4. foundry sand and slag - from iron foundries;
5. basic oxygen furnace dust and kish - generated during steel- and iron-making processes;
6. blast furnace dust and filter cake - recovered from waste gases from iron-making operations;
7. waste water treatment sludge - from steel operations;
8. electric furnace dust; and
9. inorganic material - from glass manufacturing.

Those waste materials typically contained inorganic chemicals (e.g., cadmium, chromium, and lead) and organic compounds (e.g., naphthalene) (3).

The following subsections summarize data compiled by Ford Motor Company and submitted in the *RCRA Facility Investigation Phase I Environmental Monitoring Report, Allen Park Clay Mine Landfill* (3).

### Leachate

Results of leachate samples taken in 1984 and 1985 from the landfill areas (Table 3) show the presence of cadmium, chromium, lead, and naphthalene, a noncarcinogenic polycyclic aromatic hydrocarbon (PAH). The leachate is currently discharged to the municipal sanitary sewer system. A clay dike on the perimeter of the landfill has contained leachate on site since 1982 (3).

**Surface Water**

The APCM site has a perimeter drainage system that empties into two major drains from the site, the Allen Drain northeast of the site, and the Tyre Drain southwest of the site. The site also has a treatment-and-settling pond that collects storm water runoff from the site and discharges into the perimeter drainage system that eventually empties into the Allen and Tyre drains (3).

Very few surface water samples have been collected from the site drains (Allen and Tyre) and from the treatment pond that discharges into the site perimeter drainage system. Results of sample analyses are shown in Table 4. Allen Drain was analyzed for chromium and lead only. Levels of chromium detected were less than ATSDR's comparison value. The detection limit for lead (50 ppb), however, was above ATSDR's lead comparison value. The same was true for the detection limit used for lead in Tyre Drain. Levels of carcinogenic and noncarcinogenic PAHs in Tyre drain exceeded comparison values and will be further evaluated. Concentrations of cadmium and lead in the treatment pond exceeded ATSDR's comparison values. The detection limits used to analyze for carcinogenic and noncarcinogenic PAHs in the treatment pond were above ATSDR's comparison values (3,10).

**Sediment**

Sediment samples were collected from Tyre Drain and from the on-site treatment pond that collects surface water runoff from the site (Table 5). The levels of cadmium and total chromium in the pond and Tyre Drain did not exceed their respective comparison values. In the treatment pond, levels of noncarcinogenic PAHs did not exceed comparison values while levels of carcinogenic PAHs did exceed comparison values. No comparison values were available for lead and zinc (3,10).

**Groundwater**

Ford Motor Company has installed groundwater monitoring wells at the APCM site. Sampling of those wells has shown that groundwater is contaminated with cadmium, total chromium, lead, zinc, and noncarcinogenic PAHs. Table 6 shows the maximum concentrations of groundwater contaminants detected and the associated comparison values. Levels of cadmium, chromium, zinc, and lead exceeded ATSDR's comparison values and will be further evaluated in the Pathways and/or Public Health Implications sections of this public health assessment (3,5).

**Air**

Air monitoring data were collected in 1986 when Cell I was being closed and while soil was being excavated and moved. The air samples were collected using high-volume sampling units; particulate concentrations of lead, cadmium, and chromium were determined using atomic absorption spectrophotometry. The samples were analyzed only for the inorganic contaminants shown in Table 7. Levels of particulates in the samples exceeded comparison values; the chromium detection limit was above ATSDR's comparison value (3).

**B. Off-Site Contamination**

Off-site environmental monitoring data for all media (air, soil, surface water, groundwater, sediment) were not available for areas adjacent to the APCM site.

**C. Quality Assurance and Quality Control (QA/QC)**

The conclusions and recommendations made in this public health assessment were arrived at using data developed by the Ford Motor Company and reviewed by EPA and the State of Michigan. When descriptions were provided, the quality assurance and quality control (QA/QC) measures appeared to be consistent with measures normally taken during environmental sampling and analysis. The data are assumed to be accurate within the limits of the QA/QC procedures used.

**D. Physical and Other Hazards**

The APCM site, which continues to operate as a waste disposal facility, requires the use of heavy equipment. On-site earth-moving equipment and on-site soil excavations may pose physical hazards to site trespassers, especially small children. Because access to the site is restricted, the likelihood of human contact with on-site physical hazards is reduced.

**Toxic Chemical Release Inventory**

The Toxic Chemical Release Inventory (TRI) is an on-line database, maintained by EPA, containing information (self-reports from chemical manufacturers and other companies throughout the United States) about more than 320 different substances released from facilities into the environment between 1987 and 1990. ATSDR conducted a TRI search for Wayne County, Michigan, and for the Allen Park, Dearborn, Dearborn Heights, and Melvindale communities for the 1987, 1988, 1989, and 1990 reporting years. Environmental releases of cadmium, chromium, lead, and zinc were reported for all four years in Wayne County, as well

as in the communities surrounding the Allen Park Clay Mine site. Releases of naphthalene, a noncarcinogenic PAH, were reported during those years in Wayne County, but not in the communities surrounding the site. Releases of carcinogenic PAHs, which are also contaminants of concern at the site, are not reported to TRI. A summary of air releases is shown in Table 8.

### **PATHWAYS ANALYSES**

To determine whether nearby residents are exposed to contaminants from a particular site, ATSDR evaluates the environmental and human components that lead to human exposure. That pathways analysis considers five elements: (1) sources of contamination, (2) environmental media in which the contaminants may be present or from which contaminants may migrate, (3) points of human exposure, (4) routes of human exposure such as ingestion, inhalation, or dermal absorption, and (5) exposed populations.

ATSDR identifies exposure pathways as completed or potential. For a completed exposure pathway to exist, the five elements must exist, and there must be evidence that people have, are, or could be exposed to a contaminant. A potential pathway exists when at least one of the five elements is missing, but could exist (e.g., people may have been exposed in the past, may now be exposed, or may be exposed in the future). A pathway is eliminated when one of the five elements is missing and will never exist. Completed and potential pathways may be eliminated when they are unlikely to exist, or to be significant. All completed, potential, and eliminated exposure pathways at the Allen Park Clay Mine site are shown in Table 9.

#### **A. Completed Exposure Pathways**

No completed pathways were identified; one or more elements of the pathway analysis were missing for each medium evaluated.

#### **B. Potential Exposure Pathways**

There are several potential human exposure pathways at the APCM site. Chemicals were detected in on-site environmental media at levels that may be of public health concern if people have been, are now, or could be exposed to them. There is a potential for human exposure via storm water runoff, sediments in the storm water ditches, and air. In the past, leachate may have been a potential

exposure pathway. The potential exposure pathways are described in the following paragraphs.

### **Storm Water Runoff**

On-site storm water runoff is collected in a drainage system (consisting of perimeter drains and a treatment pond) that discharges to the Allen and Tyre drains. Those drains leave the site under a highway and then run through residential neighborhoods. The two drains merge before discharging to the Rouge River.

On-site contaminants may have entered storm waters and migrated off site through the drainage system. Only limited on-site storm water data were available for ATSDR's evaluation (Table 4). The limitations of those data are discussed in the Environmental Contamination section of this public health assessment. Because no off-site storm water data were available, ATSDR assumed (using a worst-case scenario) that off-site storm waters were as contaminated as on-site storm water prior to installation of a leachate collection system. Using that assumption, a potential exposure pathway exists for children who play in the Allen and Tyre drains; they may inadvertently ingest or have skin contact with heavy metals and PAHs. Exposures may have occurred in the past, currently, or may yet in the future; however, no information is available on the magnitude, frequency, and duration of exposure for any of those time frames.

### **Leachate**

Leachate from the landfill area was a past (before 1982) potential exposure pathway. Before the leachate collection system was installed and the landfill capped, leachate probably discharged into the Allen and Tyre drains and was mixed with surface water drainage that flowed past residential neighborhoods to the Rouge River. Children who played in the drainage ditches could have been exposed to metals and PAHs through dermal contact and inadvertent ingestion. No information is available on the concentrations of contaminants (no off-site sampling data are available) or the frequency or duration of exposure.

### **Sediments**

As were surface water data, on-site sediment data are also limited (Table 5). The limitations of the data are discussed in the Environmental Contamination section. Contaminated surface soils may have washed into the drainage system during storms and migrated off site through the Allen and Tyre drains, which pass through residential neighborhoods to the Rouge River. Using the same hypothesis as with

surface water, there is a potential pathway (dermal contact and inadvertent ingestion of carcinogenic PAHs) for children who play in the Allen and Tyre drains. Exposure may have occurred in the past, may now be occurring, or may occur in the future. No information is available on the magnitude, frequency, and duration of exposures.

### **Air**

The primary mechanism by which contaminants at the site may be released to the air is by generation of fugitive (airborne) dusts from surface soils or from subsurface soils or waste materials during excavation and transport of soil at the site. Dust generation may be enhanced during windy conditions. Once airborne, contaminants may migrate to off-site areas. Prevailing winds in the site vicinity blow from the southwest (Figure 4 - Wind Rose).

Available on-site air sampling data (Table 7) were collected in 1986 during soil excavation associated with the closure of Cell I. Closing operations released contaminated soil particulates into the ambient air; on-site workers may have been exposed by inhalation, dermal contact, and incidental ingestion to air particulates, if proper personnel protective measures were not followed. The sampling data, however, are not likely to be indicative of day-to-day, on-site ambient air contamination. No long-term, on-site ambient air monitoring data are available for evaluation by ATSDR; therefore, the consequences of on-site exposure to contaminated ambient air are unknown. Additional monitoring of on-site ambient air during normal activities is needed to determine if contaminated fugitive dusts are a problem for workers not wearing personal protective equipment.

The nearby communities are separated from the APCM site by divided highways. Because no off-site air monitoring data are available, it is not known if contaminated particulates from on-site activities during 1986 were released in sufficient quantities to affect nearby communities. If so, then nearby residents may have been, may now be, and could in the future be exposed to airborne site contaminants through dermal contact, incidental ingestion, and inhalation.

The permit for a new waste cell (on site) specifies that periodic air sampling be conducted while the site is operating. When available, those analytical data should be reviewed to ensure that air particulate and contaminant concentrations are not at levels that will cause illness or disease.

### C. Eliminated Exposure Pathways

#### Groundwater

On-site groundwater is contaminated with heavy metals and PAHs; people who use the water could be exposed to contaminants through dermal contact, inhalation of volatilized contaminants, and ingestion. However, available information does not indicate that human exposure to contaminated groundwater is occurring; municipal water serves the area, and private wells are no longer used. If private wells are no longer used, groundwater is an eliminated exposure pathway.

Because of the contamination in the groundwater, ATSDR has attempted to ensure that private wells are not used in the APCM area. The hydrogeologic study of the Allen Park Clay Mine stated that there were no private wells in the vicinity of the site (5). ATSDR also contacted Michigan Department of Natural Resources about private well use; there were no reports or records of private wells in the area (7). In addition, the deep aquifer is reported to be highly mineralized, rendering the water unsuitable for drinking water or other household use. However, in spite of indications that area well water is not being used, it is conceivable that wells may have been a source of water during earlier developmental periods of the area. Therefore, it is possible that some older private wells still exist.

Hydrogeologic conditions at the site make it unlikely that wastes from the site could contaminate the groundwater. Those conditions, particularly the upward hydraulic flow gradient and the thickness (25 feet or greater) of the low permeability clay layer underlying the site, make it difficult for contaminants from the site to travel downward to the deep aquifer (5). Although contaminants were detected in on-site groundwater in the deep aquifer, the highest levels of lead and cadmium were detected in monitoring wells hydrologically upgradient of the site (3). ATSDR could not determine if the APCM site is a source of groundwater contaminants.

#### Leachate

Leachate was eliminated as a current or future exposure pathway because it is currently discharged to the sanitary sewer, effectively eliminating the potential for the public to be exposed. The leachate is treated at the municipal waste water treatment plant.

**PUBLIC HEALTH IMPLICATIONS**

The following sections (Toxicologic Evaluation, Health Outcome Data Evaluation, and Community Health Concerns Evaluation) discuss the public health implications of the potential human exposure pathways of concern at the APCM site. The toxicologic implications of the site-related contaminants are evaluated by considering the following factors: (1) the types and concentrations of contaminants detected in environmental media at the site; (2) the routes by which people may be exposed to those contaminants; and (3) the duration (how long) and frequency (how often) of potential human exposures to the contaminants.

The health outcome data are evaluated using information on the toxicologic implications to determine, to the extent possible, whether the occurrence of adverse health outcomes and associated community health concerns may be related to human exposures to contaminants.

At the Allen Park Clay Mine (APCM) site, there are no known human exposures; that is, there are no completed human exposure pathways. However, there are potential exposure pathways (particularly during excavation and construction) for on-site workers, children, and nearby residents. Exposure routes include inhalation, dermal contact, and incidental ingestion of contaminants.

**A. Toxicologic Evaluation**

The evaluation of toxicologic effects involves estimating the amount (or dose) of contaminants that an individual might be exposed to on a daily basis. The estimated exposure dose is then compared to established comparison values or health guidelines. People who are exposed for some crucial length of time to contaminants of concern, at levels above comparison values, are more likely to have an associated illness or disease.

Health-based comparison values are developed for contaminants commonly found at hazardous waste sites (see Appendix C). Examples are the ATSDR minimal risk level (MRL) and the EPA reference dose (RfD). The MRL and RfD are estimates of daily human exposure to a contaminant below which adverse health effects are unlikely. MRLs are usually generated for the ingestion and inhalation routes of exposure, and for acute, intermediate, or chronic lengths of exposure (i.e., exposures less than 14 days, 15 to 365 days, or more than 365 days, respectively). ATSDR explains many of those health guidelines in Toxicological Profiles, which also provide chemical-specific information on health effects, environmental transport, and human exposure. ATSDR Toxicological Profiles were

consulted for the toxicological evaluations discussed in the following paragraphs (11,12,13,14,15,16).

### **Surface Water and Sediment**

Collection systems put in place in 1982 and 1987 discharge leachate runoff to the city sanitary sewer system. However, it is possible that people were exposed in the past to contaminants discharging from the site. Contaminants (i.e., cadmium, chromium, lead, and naphthalene) were detected in on-site storm water and sediment (PAHs, cadmium, chromium, lead, and zinc) during sampling conducted between 1984 and 1989. Levels of those contaminants in leachate runoff and sediment do not exceed comparison values by a substantial margin, except for carcinogenic PAHs in Tyre drain water (Table 4). Restricted access to the site limits exposure to on-site sediment and storm water. Because contact with off-site sediment or water would be limited (and probably inadvertent), the resulting estimates of human exposure are not of public health concern.

### **Air (Particulates)**

The most likely pathway by which nearby residents and on-site workers may be exposed to contaminants at the APCM site is air. The primary mechanism by which contaminants could be released to air is generation of fugitive (airborne) dusts from surface or subsurface soils during soil excavation at the site.

In 1986, air monitoring data were collected during the closure of Cell I (Table 7). The maximum total suspended particulate (TSP) levels measured were greater than the EPA primary Ambient Air Quality Standard (AAQS). Air samples were also shown to contain cadmium and lead, but at levels below public health concern. Dust control measures are currently being used on site and should minimize dust generation and the potential for people to be exposed to dust.

The APCM site RCRA facility investigation Phase I environmental monitoring report (3) includes an air monitoring program that calls for quarterly air sampling for TSP, lead, cadmium, and chromium. Additional sampling for hexavalent chromium, nickel, copper, phenols, and cyanide is required when TSP levels exceed 150  $\mu\text{g}/\text{m}^3$ . ATSDR concurs with the required air monitoring program. However, consideration should be given to sampling for PAHs, which have been detected in sediment and surface water on site. Supplementary information on PAHs, is provided in Appendix E.

**Groundwater**

Data from sampling of on-site monitoring wells identified metals in both the shallow and deep aquifers (Table 6). The source of those contaminants is not known; however, the concentrations of the contaminants are such that chronic exposure would have serious public health implications. No off-site groundwater monitoring data were available for ATSDR's review; therefore, it is not known if contaminants in off-site groundwater are at levels of public health concern. Either off-site groundwater monitoring should be conducted to ensure that the groundwater is not contaminated at levels which could cause illness or disease, or efforts should be made to ensure that no private well water is used.

**B. Health Outcome Data Evaluation**

The evaluation of health outcome data may give a general picture of the health of a community, or it may confirm the presence of excess disease or illness in a community. However, elevated rates of a particular disease may not necessarily be caused by hazardous substances in the environment. Other factors, such as socioeconomic status, occupation, and personal habits, also may influence the development of disease. In contrast, even if elevated rates of disease are not found, a contaminant may still have caused illness or disease.

**Surveys Conducted By the Community**

Residents of the community of Snow Woods conducted two surveys in 1989 and 1990 to collect information on the numbers and types of adverse health effects reported by local residents. The surveys reported different types of cancer and adverse reproductive outcomes. Detailed discussions of the two surveys are included in Appendix D.

ATSDR was provided the health information collected during the two community-conducted surveys. The Agency determined that limitations of the methods and data collected prevented ATSDR from conducting statistical analyses to determine the occurrence of excess adverse health effects. Consequently, ATSDR could not make general conclusions about excess cancers or adverse reproductive outcomes using those surveys.

Although the surveys could not establish definitive answers about excess cancers or adverse reproductive outcomes, they did identify diseases of concern in the community and helped focus ATSDR's efforts in investigating other health outcome data. The surveys and other community health concerns were also

considered during the development of recommendations for public health actions and future health investigations.

**Cancer Incidence Investigations**

Cancer incidence is a community health concern associated with the APCM site. The Michigan Cancer Foundation (MCF) conducted two studies of cancer incidence for the communities surrounding the site. The first study, completed in 1983, evaluated the occurrence of cancer (from 1973 to 1981) in two census tracts that comprise the Snow Woods area of Dearborn. The second study, completed in 1989, was a followup to the first. It evaluated cancer incidence (from 1973 to 1986) in several census tracts that comprise the Snow Woods, Allen Park, and Melvindale communities (8,9).

MCF provided ATSDR with both crude (not analyzed) data and the analyzed data summaries from those studies. MCF also provided ATSDR with additional brain cancer incidence data for the years 1987 to 1990 for the same geographic areas included in the previous MCF studies. Table 10 summarizes the brain cancer incidence data from the two MCF studies (1973-1981 and 1973-1986) and the brain cancer cases reported by MCF (1987-1989) for the three communities.

**Table 10 - Summary of Brain and Liver Cancer Cases  
(1973 to 1989)<sup>a</sup>**

Study (Time Period)	Number of Cancer Cases			
	Snow Woods	Melvindale	Allen Park	Dearborn Heights
1983 Study (1973-1981)	12 Brain <sup>b</sup> 3 Liver <sup>b</sup>			
1989 Study (1973-1986)	16 Brain <sup>b</sup> 3 Liver	9 Brain 0 Liver	22 Brain 13 Liver	
1990 Data <sup>c</sup> (1973-1989)	22 Brain 3 Liver	14 Brain 4 Liver	30 Brain 15 Liver	8 Brain 3 Liver
(1973-1978)	7 Brain 2 Liver	1 Brain 1 Liver	11 Brain 5 Liver	4 Brain 3 Liver
(1979-1984)	7 Brain 1 Liver	5 Brain 1 Liver	7 Brain 6 Liver	2 Brain 0 Liver
(1985-1989)	8 Brain 0 Liver	8 Brain 2 Liver	12 Brain 4 Liver	2 Brain 1 Liver

<sup>a</sup>Data obtained from the Michigan Cancer Foundation.

<sup>b</sup>Cancer incidence rates calculated from these cases were reported as statistically significant in the Michigan Cancer Foundation studies (8,9).

<sup>c</sup>Cancer incidence rates were not determined for these cases.

### First MCF Cancer Study

In the initial MCF study, all cancer cases diagnosed by place of residence from 1973 to 1981 (with the exception of nonmelanoma skin cancers) were identified by the Michigan Cancer Foundation Cancer Surveillance System (8). Cancer rates of residents of the Snow Woods neighborhood were compared with those of the City of Dearborn, Wayne County, and the tri-county area (Wayne, Oakland, and Macomb counties) to determine whether cancer rates in Snow Woods were higher than the rates for populations with similar demographic characteristics not located near the site. Because the populations of the Snow Woods and Dearborn

neighborhoods were predominantly white (more than 98%), only cancer incidence rates for the white population segments of the control populations were used for comparison. Comparisons were also made by age and sex.

Of the 31 cancer site groups analyzed, results of the study indicated that the only statistically significant excesses of cancer (those that cannot be explained by chance) consistently found in the Snow Woods population during the 1973 to 1981 study period were brain cancer in both men and women and liver cancer in women. Results of the study did not take into account place of residence, occupational history, smoking, alcohol use, and other risk factors that may be related to cancer incidence.

### **Second MCF Cancer Study**

The second MCF study, completed in 1989, provided a followup to the initial study. It contained additional information on cancer incidence for 1982 through 1986 for residents of the Melvindale and Allen Park communities as well as for residents of the Snow Woods neighborhood (9). Place of residence was determined by census tract and included a total of 10 tracts comprising the communities of Snow Woods, Melvindale, and Allen Park. The comparison communities for the study were the City of Dearborn (excluding the Snow Woods neighborhood) and Wayne County (excluding the three study communities). Comparisons were made using only the white segment of the reference population. Adjustments were made for age and sex differences between the study and comparison populations.

The study compared the two groups with regard to their incidence of 38 different types of cancer. To obtain occupational, smoking, and residential histories, the relatives of the 16 Snow Woods residents with brain cancer were telephoned by MCF and asked to respond to a number of questions.

Results of the study indicated that between 1973 and 1986, 2,519 cancer cases were diagnosed among residents of the three study areas (Snow Woods, Melvindale, and Allen Park). Using the Dearborn comparison population, 2,638 cases were expected (the number of cancer cases that should occur if the three study areas had the same cancer incidence as the City of Dearborn). Therefore, the study area population had 5% fewer cases of cancer than were expected, based on cancer incidence rates for the City of Dearborn. Cancer cases for the study area were 8% lower than the number expected (2,743) based on Wayne County cancer incidence rates.

From the analysis of 38 cancer types, the only higher-than-expected cancer rate was seen in Snow Woods; residents there experienced 16 cases of brain cancer over the 14-year study period; 6 cases were expected based on incidence rates of the two comparison populations. In order to collect additional information about the 16 brain cancer cases, a telephone survey was conducted by MCF; two surviving individuals and the relatives of 12 persons who died of brain cancer were interviewed. The relatives of two persons who died of brain cancer could not be found. The survey obtained information on place of residence, smoking history, and occupation.

Results of the telephone survey indicated that 9 of the 16 persons with brain cancer had lived near the site for 20 years or more (that duration is significant because cancer usually develops many years after exposure). Of the seven men with brain cancer, all but one smoked; five of the seven had worked in occupations with exposure to automobile engine exhaust for lengths of time ranging from 3 to 42 years. Only one of the five women with brain cancer smoked; among the women, there was no consistent occupational history.

#### **ATSDR Cancer Evaluation**

The cancer incidence data from the two MCF studies indicate that there has been a consistent, higher-than-expected number of cases of brain cancer in the Snow Woods community between 1973 and 1986.

ATSDR requested the most current information on the number of brain and liver cancers in the study communities from 1973 to 1990. Table 11 shows that an excess in brain cancer rates was seen in Snow Woods from 1973 to 1990 (the most recent year for which cancer incidence data are available). Table 11 also shows that liver cancer rates in Allen Park, Snow Woods, and Melvindale are comparable to Wayne County and other surrounding counties (Macomb and Oakland).

Table 11. Age-adjusted brain and liver cancer incidence rates (per 100,000) near APCM site for the period 1973-1990.

Population	Brain	Liver
Allen Park	5.73	2.88
Snow Woods	14.17*	1.70
Melvindale	6.22	1.70
Wayne County	4.89	2.68
Tri-County (Macomb, Oakland, and Wayne)	5.39	2.40

Source: Michigan Cancer Foundation (Division Of Epidemiology)

\* Significantly higher than comparison communities

Age adjusted: Age adjusted to the 1970 U.S. population standard population to eliminate age differences among the populations before comparison.

The available environmental and human health outcome data for the site indicate that although there is an apparent excess number of brain cancers for the period 1973-1990, the excess could not be attributed to the Allen Park Clay Mine site. Recently, MCF stated that no brain cancer cases have been reported in the Snow Woods for either 1990 or 1991, the two most recent years for which reporting is complete (17). No completed environmental and human exposure pathways were found for the site. Information known about potential pathways does not indicate that the site contaminants are at concentrations that may be related to an excess occurrence of brain cancer. Alternative factors, such as other environmental, lifestyle, and occupational factors, may have contributed to this observed occurrence of excess cancer in the Snow Woods community (general information about the health concerns is discussed in Appendix E).

**C. Community Health Concerns Evaluation**

ATSDR has addressed each of the community concerns about health as follows:

- 1. Is the incidence of cancer (including prostate, brain, bladder, colon, and bone cancers, and leukemia) in the Snow Woods, Melvindale, and Allen Park communities higher than in other parts of Michigan?**

Between 1973 and 1986, the cancer incidence in the three areas was similar to the rest of Wayne County except for the elevated brain cancer incidence in Snow Woods. Cancers evaluated by the Michigan Cancer Foundation (MCF) included stomach, colon, rectum, liver, esophagus, small intestine, anus, gallbladder, pancreas, retroperitoneum, nasal cavity, larynx, lung and bronchus, trachea, bones and joints, soft tissues, prostate, testis, breast, cervix, ovary, vulva, kidney, ureter, other urinary system organs, eye, thyroid, melanomas, Hodgkin's disease, non-Hodgkin's lymphomas, leukemia, and ill-defined cancer types. There were 16 cases of brain cancer in Snow Woods over the 14-year study period. No completed human exposure pathways were found for the APCM site, and information known about the potential pathways of concern does not indicate that contaminants are present that may be related to an excess occurrence of brain cancer. Because of the small number of cases and the lack of information on important risk factors for brain cancer (e.g., lifestyle, occupational exposures), there is no explanation for the excess. ATSDR's evaluation showed that only rates of brain cancer in Snow Woods were elevated. To further evaluate the risk of brain cancer in the area, ATSDR's Health Activities Recommendation Panel (HARP) has recommended a community health investigation of brain cancer in communities around the APCM site. ATSDR will collaborate with qualified agencies or institutes during that investigation. More information about brain cancer is provided in Appendix E.

- 2. Are the incidences of adverse health outcomes (death, asthma, allergies, emphysema, cirrhosis of the liver, congenital heart defects, and hepatitis) in Snow Woods, Melvindale, and Allen Park higher than in other parts of Michigan?**

Information on mortality rates (death) and occurrence and treatment of respiratory diseases was not available for the communities around the APCM site and therefore could not be evaluated. From its evaluation of the available environmental data, ATSDR found no contaminants related to the site that may contribute to congenital heart defects, cirrhosis of the liver, or

hepatitis. Environmental contributions to those diseases are minimal compared with other risk factors, such as infectious diseases, lifestyle, genetic defects, occupational exposure, and alcoholism. Information about health effects related to community concerns is discussed in Appendix E.

**3. How will local residents with preexisting adverse health conditions (such as asthma) be affected by this landfill?**

Under current conditions, the health of local residents is not expected to be affected by the APCM site because of the lack of a completed exposure pathway. However, monitoring of fugitive dust and air contaminants during future operations of the landfill is needed to ensure that air particulate and contaminant concentrations do not reach levels that will endanger public health. Periodic air sampling is required by the permit for a new waste cell on the APCM site and corrective measures are required if air particulate and contaminant concentrations exceed standards in the permit. These actions should prevent local residents with preexisting adverse health conditions from being affected by the landfill.

**4. Could other industries be contributing to environmental contamination in the area?**

A review of the EPA Toxic Release Inventory showed that there are other sources of contamination in the Allen Park, Melvindale, Dearborn, and Dearborn Heights areas. For example, there were more than 200 environmental releases in the city of Dearborn during the three-year period of 1987-1989. The Toxic Release Inventory Section of this document includes additional information about reported industrial releases of contaminants in Wayne County and in the specific communities surrounding the site.

**5. Could air particulate matter (silt) that regularly accumulates on residential windows and cars in nearby areas be harmful to health?**

Particulates can be detrimental to human health. The particulate matter can be toxic or act as a carrier of an absorbed hazardous substance. It can also interfere with the body's ability to clear the respiratory tract.

A maximum air particulate concentration of 1,089  $\mu\text{g}/\text{m}^3$  was detected on site during the closing of landfill Cell I. That concentration exceeded the former National Ambient Air Quality Standard for total suspended particulates; the standard was intended to protect public health. However,

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it is not known if, or at what concentration, particulates migrated to off-site residential areas.

The permit for the new waste cell (Cell II) specifies that on-site air will be periodically sampled while the cell is operating.

## CONCLUSIONS

1. The Allen Park Clay Mine landfill is an indeterminate public health hazard because additional information is needed to evaluate possible air exposure pathways. There may have been air exposure pathways in the past. However, there is no information documenting exposure levels or duration.
2. Air monitoring data collected in 1986 indicate that concentrations of inorganic metals (cadmium and lead) are below health-based comparison values; however, there are data gaps for organic compounds (polycyclic aromatic hydrocarbons).
3. On-site groundwater monitoring identified metals at levels that could adversely affect human health if groundwater was consumed. However, because there is no indication that groundwater is used for drinking water, the contaminants are not a public health concern.
4. There is a potential exposure pathway for children who play in the Allen and Tyre drains. Levels of contaminants in storm water runoff and sediments off site were assumed to be the same as levels on site. At those levels, intermittent exposure is not of public health concern.
5. Available health outcome data indicate that there was a statistically significant excess occurrence of brain cancer in men and women (from 1973 to 1986) and of liver cancer in women (from 1973 to 1981) in the Snow Woods community of Dearborn. More recent information (1987 to 1990) on the number of brain cancer cases in the Snow Woods community suggests that the excess brain cancer may have persisted throughout the period of 1973 to 1990.
6. Previous health outcome data indicated that, from 1973 to 1981, there was an excess number of liver cancer cases in the Snow Woods community. More recent data indicate that the cancer incidence is no longer significantly elevated.
7. The available environmental and health outcome data for the site indicate that, although an apparent excess number of brain cancers was observed for the period of 1973-1990, the excess could not be attributed to the APCM site.

## RECOMMENDATIONS

### A. Recommendations and HARP Statement

#### Recommendations

1. The permit for a new waste cell (on site) specifies that periodic air sampling be conducted while the site is operating. The monitoring should include analyses for metals, particulates, and organic contaminants of concern, such as PAHs. When available, those analytical data should be reviewed to ensure that air particulate and contaminant concentrations are at levels that will not endanger public health.
2. Because on-site groundwater is contaminated with elevated levels of metals, efforts should be made to monitor groundwater off site, or to ensure that private well water in the area is not used in the future unless treated.
3. Consider additional follow-up activities if data become available suggesting that people have been or are being exposed to site-related contaminants.

#### HARP Statement

In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended, the Allen Park Clay Mine site, Wayne County, Michigan, has been evaluated by the ATSDR Health Activities Recommendation Panel (HARP) to determine if any appropriate follow-up health activities are indicated at this site. There is no evidence that environmental exposures have occurred at this site. However, because of the elevation of brain cancer incidence rates, the panel determined that conducting a community health investigation and health statistics review is indicated. A community health investigation is a medical or epidemiologic evaluation of descriptive health information about individual persons to evaluate and determine health concerns and to assess the likelihood they may be linked to exposure to hazardous substances. A health statistics review is an evaluation of information and/or relevant health outcome data for an involved population. ATSDR will also evaluate any new data or information it receives about this site to determine if additional public health actions are appropriate.

**B. Public Health Action Plan**

The purpose of the Public Health Action Plan (PHAP) is to ensure that this public health assessment not only identifies public health hazards but also provides a plan of action designed to mitigate and prevent adverse human health effects resulting from exposure to hazardous substances in the environment.

**Actions Undertaken**

1. ATSDR held a public availability meeting on February 11, 1991, at the City Hall of Dearborn, Michigan, with the assistance of representatives from the state departments of health and natural resources. ATSDR staff discussed community health concerns associated with the Allen Park Clay Mine Landfill.
2. ATSDR has conducted a health statistics review of age-adjusted incidence rates for liver and brain cancer near the APCM site for the period 1973 - 1990. The results of this review are included in the Health Outcome Data Section of this document.
3. ATSDR has identified the excess incidence of brain cancer cases in the Snow Woods area for a possible community health investigation. ATSDR has requested proposals for Agency evaluation. The implementation of the proposal for a community health investigation will depend on the availability of funds and a state-affiliated agency to conduct the investigation.

**Actions Planned**

1. ATSDR, in cooperation with appropriate public health agencies, will evaluate the feasibility and resources to pursue implementing the health actions determined to be needed by the HARP. In addition, ATSDR will collaborate with appropriate federal, state, and local agencies to pursue the implementation of the recommendations outlined in this public health assessment.
2. The Michigan Department of Natural Resources is requiring additional on-site air monitoring when the facility begins receiving hazardous waste.

ATSDR will reevaluate and expand the Public Health Action Plan when needed. New environmental, toxicological, or health outcome data, or the results of implementing the above proposed actions may determine the need for additional actions at this site.

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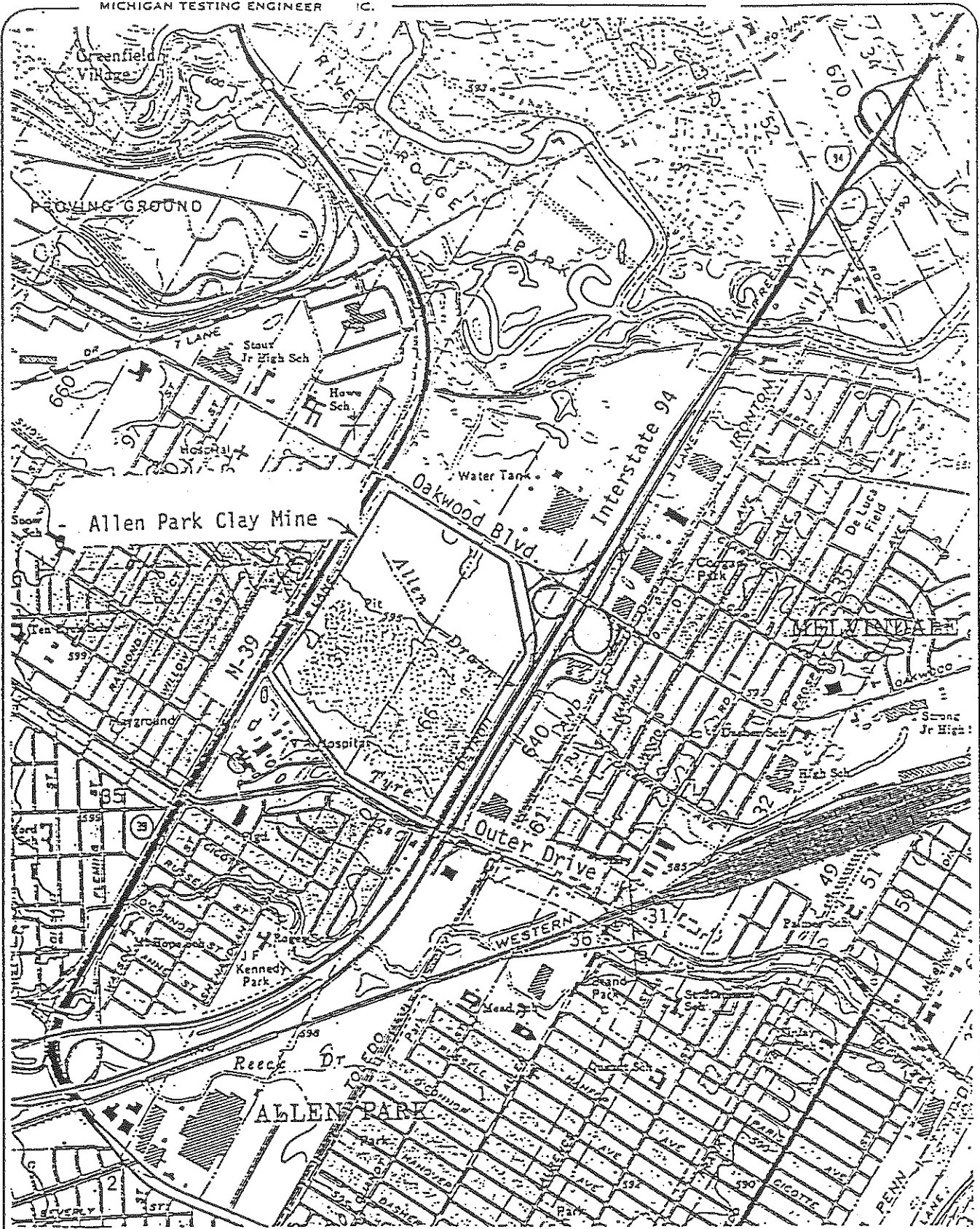
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**APPENDIX A - FIGURES**





0 1000 2000 3000 4000 5000

Scale - Feet  
Contour Interval 5 Feet  
Datum is Mean Sea Level

Allen Park Clay Mine  
Disposal Landfill  
Allen Park, Michigan  
Wayne County

Figure 1  
Area Map

NOTES:

1. General Layout Of Site Facilities From Drawing Supplied By Wayne Disposal, Inc., Entitled "Allen Park Clay Mine" Dated 9-12-79, Rev. 5-1-81, Sheet No. C-2 of Drawing No. 79P - 23,6.
2. Location And Elevation of Bench Marks Obtained From Charles E. Raines Company

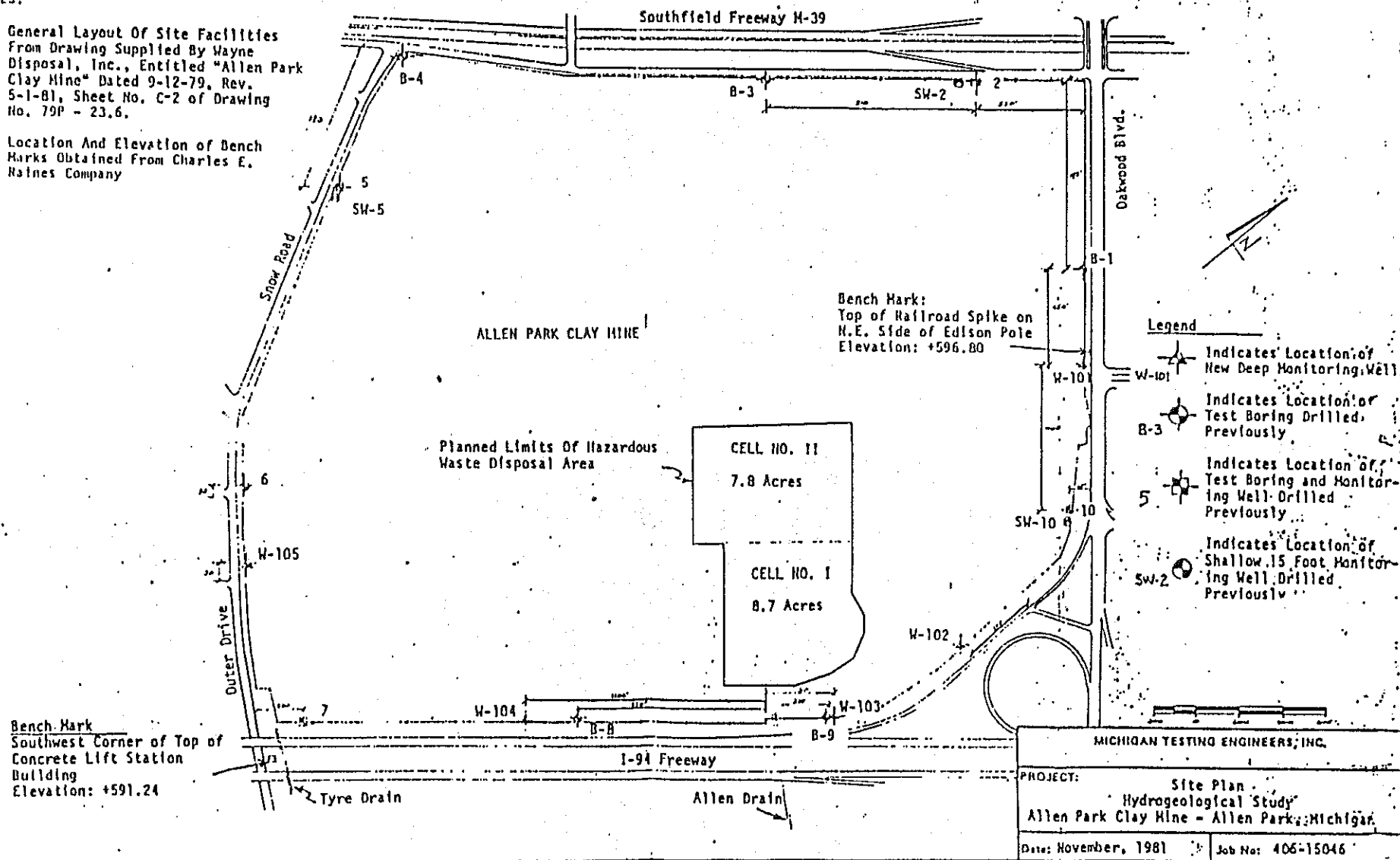


Figure 2  
Site Map

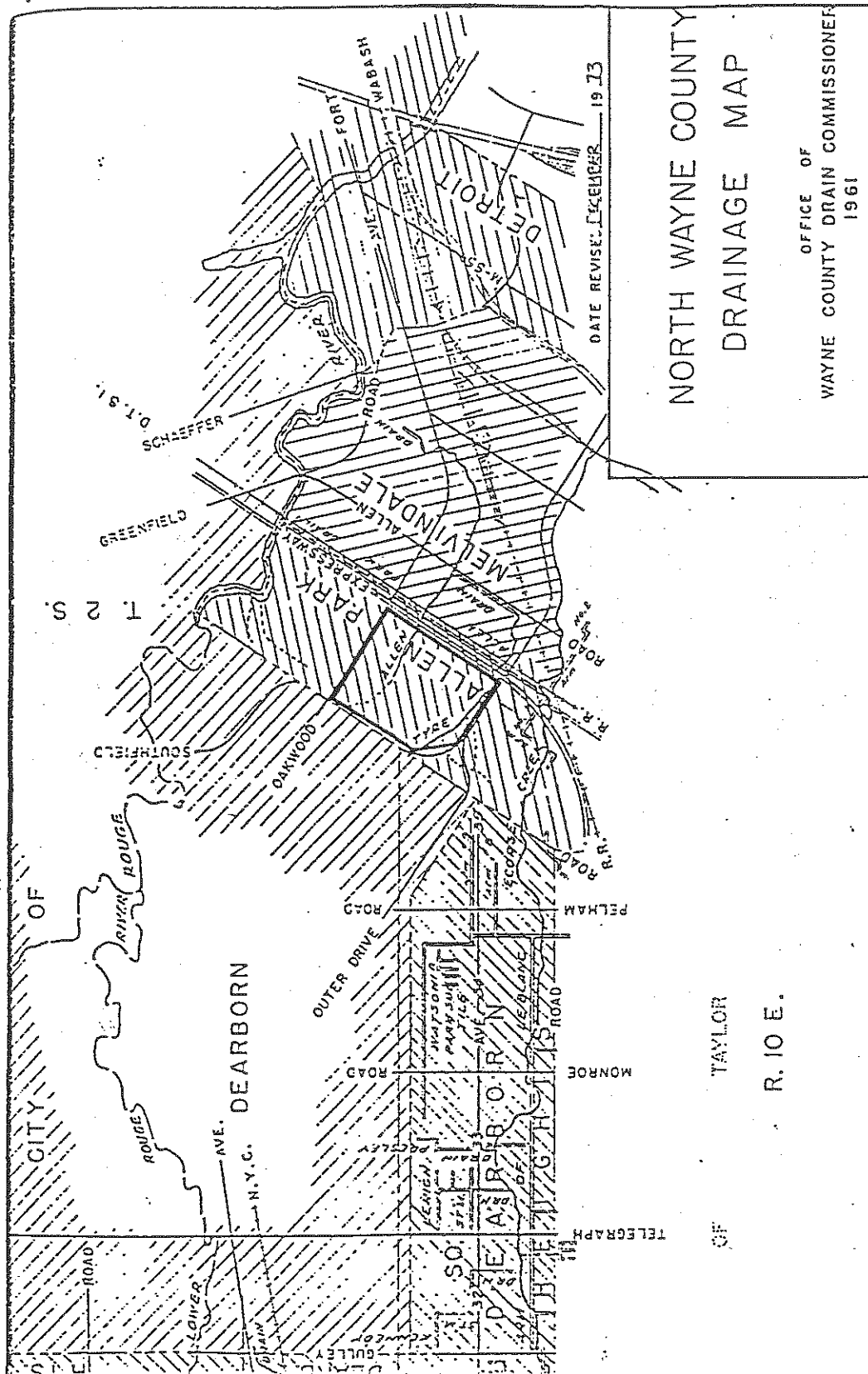
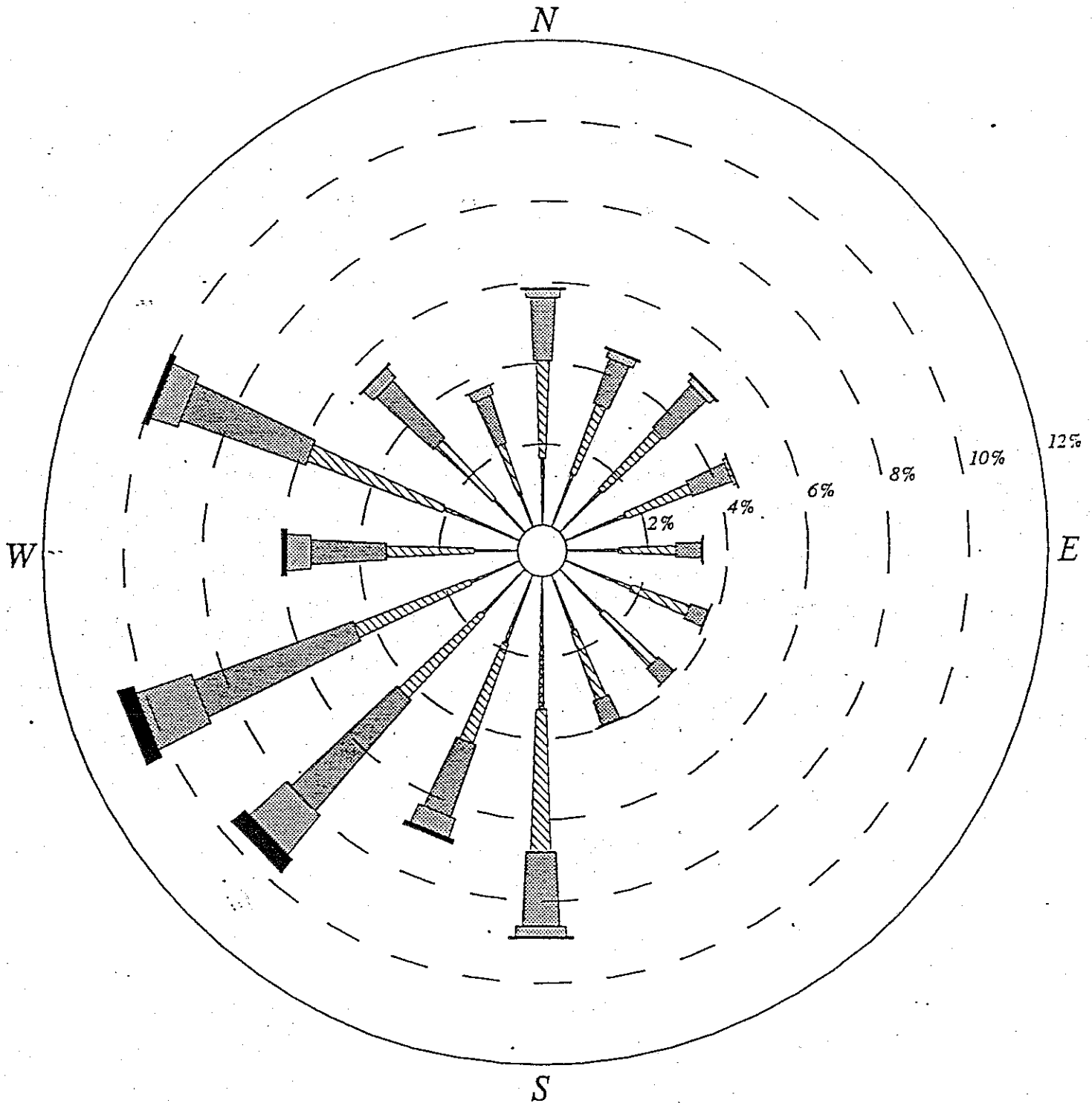


Figure 3  
Storm Water Drainage Map

Allen Park, MI ('84-89)

January 1-December 31; Midnight-11 PM



CALM WINDS 3.40%

WIND SPEED (KNOTS)

NOTE: Frequencies  
indicate direction  
from which the  
wind is blowing.

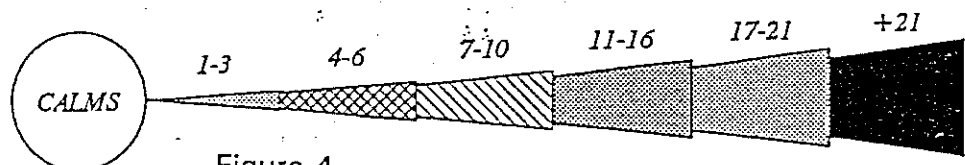


Figure 4  
Wind Rose

APPENDIX B - TABLES



TABLE 1 - POPULATION DATA

	*Site	@Allen Park	#Melvindale	&Dearborn
Total persons	2,270	6,709	11,235	6,215
Total area, square miles	1.77	1.41	2.79	1.27
Persons per square mile	1,283	4,759	4,027	4,894
% Male	52.8	47.4	48.3	47.7
% Female	47.2	52.6	51.7	52.3
% White	91.0	98.0	93.6	98.7
% Black	5.8	0.0	2.9	0.1
% American Indian, Eskimo, or Aleut	0.2	0.3	1.0	0.2
% Asian or Pacific Islander	2.0	1.0	0.8	0.8
% Other races	1.1	0.7	1.7	0.2
% Hispanic origin	4.8	4.1	5.6	1.8
% Under age 10	8.6	12.4	13.0	11.3
% Age 65 and older	20.6	20.2	14.1	21.0

Source: 1990 Census of Population and Housing, Summary Tape File 1 (Michigan).  
 Prepared by Bureau of the Census, Washington, DC, 1991.

\* Census Tract 5760  
 @ Census Tract 5761  
 # Census Tracts 5785 and 5786  
 & Census Tracts 5755 and 5756

TABLE 2 - HOUSING DATA

	*Site	@Allen Park	#Melvindale	&Dearborn
Households*	827	2,637	4,677	2,459
Persons per household	2.45	2.53	2.40	2.52
% Households owner-occupied	75.0	87.5	64.0	94.4
% Households renter-occupied	25.0	12.5	36.0	5.6
% Households mobile homes	0.1	0.1	1.0	0.0
Median value, owner-occupied households, \$	70,300	56,800	~37,000	~75,000
Median mo. rent, renter-occupied households, \$	518	742	342	~550

\* A household is an occupied housing unit, but does not include group quarters such as military barracks, prisons, and college dormitories.

Source: 1990 Census of Population and Housing, Summary Tape File 1 (Michigan). Prepared by Bureau of the Census, Washington, DC, 1991.

\* Census Tract 5760  
 @ Census Tract 5761  
 # Census Tracts 5785 and 5786  
 & Census Tracts 5755 and 5756

TABLE 3. CONTAMINANTS IN ON-SITE LEACHATE AT ALLEN PARK

CONTAMINANT	MAXIMUM CONCENTRATION (ppb)	DATE	SOURCE
Cadmium	40	8/84	3
Chromium	340	12/84	3
Lead	485	4/85	3
Zinc	40	7/84	3
Carcinogenic PAHs	NA		3
Noncarcinogenic PAHs	2704	7/84	3

NA = Not analyzed

TABLE 4. PAST CONTAMINANTS IN ON-SITE STORM WATER/TREATMENT POND AT ALLEN PARK

CONTAMINANT	MAXIMUM CONCENTRATION (ppb)(1)									COMPARISON VALUE	
	ALLEN DRAIN	DATE	SOURCE	TYRE DRAIN	DATE	SOURCE	TREATMENT POND	SOURCE	DATE	VALUE (ppb)	Source <sup>1</sup>
Cadmium	NA		3	NA		3	20	3	7/84	2	EMEG (child)
Chromium	30	4/84	3	<20	3/85	3	<20	3	5/85	50	Rfd (child)
Lead	<50	3/85	3	<50	3/85	3	40	3	7/84	0	MCLG
Zinc	NA		3	NA		3	NA	3		2100	LTHA
Carcinogenic PAHs	NA		3	15	7/84	10	<500	3	11/84	.006	CREG <sup>2</sup>
Noncarcinogenic PAHs	NA		3	69	7/84	10	<500	3	11/84	20	LTHA <sup>3</sup>

<sup>1</sup> See Appendix C for definitions.

<sup>2</sup> Used comparison value for benzo(a)pyrene

<sup>3</sup> Used comparison value for naphthalene

NA = Not analyzed

ND = Not detected

TABLE 5. CONTAMINANTS IN ON-SITE SEDIMENT

CONTAMINANT	MAXIMUM CONCENTRATION (mg/kg)						COMPARISON VALUE	
	TREATMENT POND	DATE	SOURCE	TYRE DRAIN	DATE	SOURCE	CONCENTRATION (mg/kg)	SOURCE <sup>1</sup>
Cadmium	3.6	05/89	3	1.6	8/83	3	25	EMEG
Chromium, total	9.8	12/88	3	1.0	8/83	3	200	EMEG
Lead	24.0	12/88	3	6.3	8/83	3	none	
Zinc	.27	11/84	3	NA		3	none	
Carcinogenic PAHs	.776	12/84	10	NA		3	.12	CREG <sup>2</sup>
Noncarcinogenic PAHs	.820	12/84	10	NA	8/83	3	Est. 2,000	RfD <sup>3</sup>

<sup>1</sup> See Appendix C for definitions.

<sup>2</sup> Used comparison value for benzo(a)pyrene

<sup>3</sup> Estimated comparison value for naphthalene

ND = Not detected

NA = Not analyzed

TABLE 6. CONTAMINANTS IN ON-SITE GROUNDWATER AT ALLEN PARK\*

CONTAMINANT	MAXIMUM CONCENTRATION (ppb) <sup>1</sup>				COMPARISON VALUE	
	AQUIFERS				CONCENTRATION (ppb)	REFERENCES <sup>1</sup>
	SHALLOW	DATE	DEEP	DATE		
Cadmium	20	8/81	240	8/81	2	EMEG (child)
Chromium	50	5/81	210	4/84	50	Rfd (child)
Lead	240	12/88	1000	3/85	0	MCLG
Zinc	NA		37,000	12/80	2100	LTHA
Carcinogenic PAHs	NA		NA		.006	CREG <sup>2</sup>
Noncarcinogenic PAHs	20	2/89	18	11/87	20	LTHA <sup>3</sup>

<sup>1</sup> See Appendix C for definitions.

<sup>2</sup> Used comparison value for benzo(a)pyrene

<sup>3</sup> Used comparison value for naphthalene

NA = Not analyzed

ND = Not detected

\* All values are from reference 3, except for zinc, which was derived from information in reference 10

TABLE 7. CONTAMINANTS IN ON-SITE AIR<sup>1</sup>

CONTAMINANT	MAXIMUM CONCENTRATION ( $\mu\text{g}/\text{m}^3$ )	DATE OF SAMPLING	COMPARISON VALUE	
			CONCENTRATION ( $\mu\text{g}/\text{m}^3$ )	SOURCE <sup>2</sup>
Cadmium	0.007	8/86	.2	EMEG
Chromium, total	<0.80	8/86	0.000083	CREG
Lead	0.242	9/86	1.5	NAAQS <sup>3</sup>
Particulates (total suspended)	1,089	9/86	260	NAAQS <sup>3</sup>
Zinc	NA		None	
Carcinogenic PAHs	NA		None	
Noncarcinogenic PAHs	NA		None	
An air monitoring station was placed at the eastern edge of the site and adjacent to Interstate 94 between August and November 1986.				

<sup>1</sup> All values are from reference 3 and represent air samples collected during construction

<sup>2</sup> See Appendix C for definitions

<sup>3</sup> National Ambient Air Quality Standard

NA = Not analyzed

**TABLE 8. SUMMARY OF AIR RELEASES <sup>1</sup> FOR ALLEN PARK, DEARBORN, DEARBORN HEIGHTS, AND MELVINDALE (lbs)**

CONTAMINANT	1987	1988	1989	1990
Cadmium	0	0	0	36
Chromium	257	18,024	1	1
Lead	277	851	5	4,349
Zinc	0	250	250	5
Carcinogenic PAHs	NR	NR	NR	NR
Noncarcinogenic PAHs	0	0	0	0

NR - Not Reported

<sup>1</sup> U.S. Environmental Protection Agency Toxic Chemical Release Inventory

TABLE 9. EXPOSURE PATHWAYS AT ALLEN PARK CLAY MINE

PATHWAY NAME	EXPOSURE PATHWAY ELEMENTS					TIME
	CONTAMINANTS OF CONCERN	MEDIA	POINT OF EXPOSURE	ROUTE OF EXPOSURE	EXPOSED POPULATION	
POTENTIAL EXPOSURE PATHWAYS						
STORM WATER RUNOFF	Metals, PAHs	Storm water runoff	Storm water drains downgradient of site	Dermal Ingestion	Children playing in storm water drains downgradient of the site.	Past Present Future
LEACHATE	Metals, PAHs	Leachate	Direct contact	Dermal Ingestion	Children playing in storm water drains downgradient of site before 1987	Past
SEDIMENTS	Metals, PAHs	Sediments	Direct contact with drain sediment	Dermal Ingestion	Children playing in drains downgradient of the site	Past Present Future
AIR	Metals, PAHs	Ambient air	On-site workers Nearby residences	Dermal Ingestion Inhalation	Residents downwind of the site	Past Present Future
ELIMINATED EXPOSURE PATHWAYS						
GROUNDWATER	Metals, PAHs	Groundwater	Wells downgradient of the site	Dermal Inhalation Ingestion	No wells are known to exist within 3 miles of the site	Past Present Future
LEACHATE	Metals, PAHs	Leachate	Direct contact	Dermal Ingestion	Contact with leachate unlikely because leachate discharges to sanitary sewer	Present Future



**APPENDIX C - COMPARISON VALUES**



### Comparison Values

Comparison values used in ATSDR public health assessments are contaminant concentrations in specific media used to select contaminants for further evaluation. The values provide guidelines for estimating a dose at which health effects might be observed. When more than one comparison value exists for a contaminant in a particular medium, ATSDR uses the most conservative (lowest) value. Comparison values and units of measure used in the Environmental Contamination and Other Hazards and the Public Health Implications sections of this public health assessment are described in the following paragraphs.

- \* CLHA = Child Longer-Term Health Advisory
- \* CREG = Cancer Risk Evaluation Guide
- \* EMEG = Environmental Media Evaluation Guide
- \* LTHA = Lifetime Health Advisory
- \* MCL = Maximum Contaminant Level
- \* MCLG = Maximum Contaminant Level Goal
- \* MRL = Minimal Risk Level (mg/kg/day)
- \* NAAQS = National Ambient Air Quality Standard
- \* RfD = Reference Dose (mg/kg/day)
  
- \* ppm = milligrams per liter (mg/L water)  
milligrams per kilogram (mg/kg soil)
- \* ppb = micrograms per liter ( $\mu$ g/L water)  
micrograms per kilogram ( $\mu$ g/kg soil)
- \* kg = kilogram
- \* mg = milligram
- \*  $\mu$ g = microgram
- \* L = liter

Child Longer-Term Health Advisories (CLHAs) are contaminant concentrations that the Environmental Protection Agency (EPA) believes will protect public health (taking into consideration the availability and economics of water treatment technology) using a child's weight and ingestion rate.

Cancer Risk Evaluation Guides (CREGs) are estimated contaminant concentrations that would be expected to cause no more than one excess cancer in a million persons exposed over a lifetime (70 years). CREGs are calculated from EPA's cancer slope factors.

Environmental Media Evaluation Guides (EMEGs) are media-specific comparison values used to select contaminants of concern at hazardous waste sites. They are calculated using ATSDR minimal risk levels (MRLs) and factor in body weight and ingestion rates.



Lifetime Health Advisories (LTHAs) are contaminant concentrations that the Environmental Protection Agency (EPA) believes will protect public health (taking into consideration the availability and economics of water treatment technology) over a lifetime (70 years) at an ingestion rate of 2 liters of water per day.

Maximum Contaminant Levels (MCLs) are maximum permissible contaminant concentrations in drinking water that EPA believes will protect public health (considering the availability and economics of water treatment technology) over a lifetime (70 years) at an exposure rate of 2 liters per day (for an adult).

Maximum Contaminant Level Goals (MCLGs) are drinking water health goals set at levels at which no known or anticipated adverse health effect occurs and which allow an adequate margin of safety. Such levels consider the possible impact of synergistic effects, long-term and multi-stage exposures, and the existence of susceptible groups in the population. When there is no safe threshold for a contaminant, the MCLG should be set at zero.

A Minimal Risk Level (MRL) is an estimate of daily human exposure to a chemical (in mg/kg/day) that is likely to be without an appreciable risk of deleterious effects (noncancer) over a specified duration of exposure. MRLs are calculated using data from human and animal studies, and are reported for acute ( $\leq 14$  days), intermediate (15-364 days), and chronic ( $\geq 365$  days) exposures. MRLs for specific chemicals are published in ATSDR Toxicological Profiles.

The National Ambient Air Quality Standards (NAAQS) are established under Section 109 of the Clean Air Act; they apply to any pollutants that, if present in air, might endanger public health. The standards are not enforceable; rather, they establish ceilings that are not to be exceeded in the area in which the contaminant source is located.

EPA's Reference Dose (RfD) is an estimate of the lifetime daily exposure to a contaminant that is unlikely to cause adverse (noncancer) health effects.

#### Comparison Value References

1. Agency for Toxic Substances and Disease Registry. Health Assessment Guidance Manual. Atlanta: ATSDR, March 1992.



**APPENDIX D - SUMMARY OF SURVEYS CONDUCTED BY THE COMMUNITY**



## SUMMARY OF SURVEYS CONDUCTED BY THE COMMUNITY

Table 12. Self Reported Study for Snow Woods (Ash and Venice Streets)

Cancer Type	Number of Cases	Number of Deaths
Lung	5	5
Brain	2	2
Lung and Brain	1	1
Throat	1	1
Unspecified	11	8
Adverse Reproductive Outcome	Number of Cases	Number of Deaths
Stillbirth (late fetal death)	1	1
Congenital Heart Defect	1	1
Miscarriages	2	2
Genitourinary Disorders	4	0

Residents of the community near APCM have conducted surveys to collect information on the numbers and types of adverse health effects reported by local residents. One citizen conducted a survey (in 1990) of self-reported cancer and reproductive outcomes among citizens residing near Ash and Venice streets in the Snow Woods area of Dearborn. Twenty local residents of unknown age and race were surveyed; they reported information about cancer occurrence and death from cancer and about selected adverse reproductive outcomes (Table 12).

A second health survey, of the Snow Woods neighborhood of Dearborn, Michigan, was conducted (in 1989) by two local residents. The residents used a neighborhood cancer survey form provided by the Wayne County Health Department, Environmental Protection Bureau, to conduct the survey. The survey form included information on address, years of residence in the neighborhood, occupation, smoking status, sex, cancer diagnosis, and other health complaints. Respondents lived north and south of Snow Woods Road, within the boundaries of the U.S. Postal Service ZIP Code area numbered 48124. Residences included in

the survey were approximately one-third of the total number of residences in the Snow Woods neighborhood of Dearborn.

A summary of reported cancer occurrence in women and men is provided in Tables 13 and 14. As shown in those tables, the most frequently reported cancers in women were cancers of the breast, colon, and uterine cervix (cervical cancer), particularly in women aged 46 to 65 years. The most frequently reported cancers in men were lung, brain, and colon cancers, particularly in men aged 46 to 65 years. Leukemia was reported in 3 males younger than 15 years.

The survey included information on smoking status at the time of the survey; however, information was not collected on smoking history (past smoking), the duration (how long) and frequency (how often), and the type (e.g., cigarette, cigar). Because smoking may cause or contribute to development of many types of cancer, that information is important in determining whether smoking may have contributed to the reported occurrences of cancer in community residents.

Information on smoking status collected during the survey indicated that approximately 18 of the 35 women (51%) who reported having cancer considered themselves to be smokers or to have been smokers within the 10-year period before their cancers were diagnosed. Among the 10 women who reported breast cancer, 4 (40%) were smokers; among the three women with lung cancer, 1 (33%) was a smoker. Approximately 13 of the 32 men (41%) who reported having cancer were reported to be smokers. Among the 10 men who reported having lung cancer, 6 (60%) were smokers. Available information suggests that smoking may contribute to the occurrence of lung cancer (18).

Occupational information collected during the survey was reviewed to determine whether people who reported having cancer had similar occupations. Occupational exposures to contaminants and other agents have been shown to cause or contribute to the occurrence of various types of cancer. Available information does not reveal any similar trends in occupation for persons who reported having cancer. The data indicate that the majority of women who responded to the survey were homemakers, clerks or office personnel, nurses, and maids. The majority of men who responded were engineers, foremen, or supervisors for General Motors Corporation; teachers or professors; and craftsmen (wood workers, machinists).

Information on the age and number of years in residence in the neighborhood indicates that the majority of respondents were more than 45 years old and had lived in the area 20 to 30 years. That information suggests that the Snow Woods area of Dearborn is a stable (rather than transient) community.

Medical information confirming the reported adverse health outcomes (cancer and adverse reproductive outcomes) was not collected for either of the two

self-reported surveys. Likewise, information was not available on the completeness and accuracy of information for the reported types of cancer, date of cancer diagnosis, years of residence in the area, smoking status, and occupation. For the first survey, information was not available about the selection of households for the survey, and the age, sex, race, occupation, and smoking status of the respondents.

**Table 13. Summary of Citizens' Self-Reported Health Survey (1989)**

**Cancer in Men**

Cancer Type	Age at Diagnosis (in years) <sup>a</sup>								Total
	<15	15-25	26-35	36-45	46-55	56-65	66-75	>75	
Skin					1	1			2
Colon					2	2			4
Lung					2	4	3	1	10
Leukemia	3				1				4
Brain	1				2	1	1		5
Lymphoma					1	1			2
Kidney							1		1
Larynx							1		1
Pancreas					1		1		2
Liver					1				1
Prostate						1	2		3
Total	4	0	0	0	11	11	8	1	35 <sup>b</sup>

\* Medical information confirming cancer diagnoses was not collected as part of the survey.

<sup>a</sup> The reported age at diagnosis (of each man) was used.

<sup>b</sup> Three men reported two types of cancer; both were included in this table. A total of 32 men reported having cancer.

Table 14. Summary of Citizens' Self-Reported Health Survey (1989)

## Cancer in Women

Cancer Type	Age at Diagnosis (in years) <sup>a</sup>								Total
	<15	15-25	26-35	36-45	46-55	56-65	66-75	>75	
Skin				1		1			2
Colon					1	3	1	1	6
Breast				3	2	1	3		9
Thyroid				1					1
Lung					2	1			3
Ovary					2		1		3
Leukemia		1							1
Bone					1				1
Uterine (Cervix)			1		1	3			5
Gallbladder					1				1
Brain					1	1			2
Lymphoma				1	1				2
Stomach						1		1	2
Total		1	1	6	12	11	5	2	38 <sup>b</sup>

<sup>a</sup> The reported age at diagnosis (of each woman) was used.

<sup>b</sup> Three women reported two types of cancer; both were included in this table. A total of 35 women reported having cancer.

Medical information confirming cancer diagnoses was not collected.

**APPENDIX E - ADDITIONAL HEALTH INFORMATION**



### Additional Health Information

#### Brain Cancer

Cancers of the brain are characterized as primary or secondary lesions. Primary brain cancers originate within the central nervous system (CNS) and do not usually metastasize (spread) beyond the CNS pathways. Secondary brain cancers originate at distant places in the body and metastasize to the central nervous system. The focus of this public health assessment is on primary brain cancers. The available health outcome (cancer incidence) data pertinent to the site pertain only to primary brain cancers and not to secondary or metastatic brain cancers that originate at biologic sites distant from the brain. Information on the biologic site of origin for metastasized brain cancers is not available for cancer cases at this site; that type of information would be needed to evaluate causes of, or factors contributing to, the occurrence of those types of cancers.

Primary brain cancers occur at varying rates depending on age, sex, and race. The most common type of brain cancer, accounting for more than half of all adult brain cancers, is glioma, a fast-growing cancer in the upper part of the brain. In adults, brain cancers occur most often between the ages of 55 and 79 (18).

A recent report (19) using data from the National Cancer Institute's Surveillance, Epidemiology and End Results (SEER) program documented that national age-specific incidence rates for primary malignant brain tumors (in men and women) increased dramatically between the years 1973-74 and 1985.

The report attributed this observed increase in cancer incidence in older persons to use of improved x-ray techniques for tumor diagnoses since 1973, or to other single or combined genetic, viral, chemical, radiologic, or developmental factors.

Except for meningiomas, a benign tumor of the membranes that surround the brain and spinal cord, men have a higher incidence than women of all types of benign and malignant nervous system tumors. In the United States, brain cancers occur more often in whites than in African-Americans (18).

Brain cancer is the second most common type of cancer in children and occurs most often in children under 10 years. Children have a higher incidence of medulloblastoma, a cancer that affects the part of the brain connected to the spinal cord. It accounts for almost a quarter of all childhood brain cancers, but fewer than 2% of adult brain cancers.

Few studies indicate causative factors for brain tumors, although toxicologic, epidemiologic and medical data suggest a relationship with occupational, environmental, viral, and genetic factors (18).

Numerous retrospective studies have been conducted to determine possible occupational factors that cause or contribute to the occurrence of primary brain cancers. Collectively, those studies suggest that certain brain cancers are more frequent among workers in specific occupational settings. Specific information on types and duration and frequency of chemical exposures is not available for the majority of those occupational studies.

Among occupations involving potential exposure to chemical carcinogens, it has been suggested that there have been excess brain cancers in workers in rubber-manufacturing plants who are exposed to vinyl chloride (18,20-22); polyvinyl chloride production workers (20,22); farmers, including cattle and sheep ranchers, dairy farmers, and grain millers (18,20,23,24); chemists (18), pharmaceutical workers (18,20); embalmers (18); electricians and persons potentially exposed to electric and magnetic fields (21,22); dentists (22); workers in production of petroleum and petrochemicals (18,20,22); aircraft workers (22); and workers who may be exposed to metal dusts or fumes (21).

Excess mortality from primary brain cancer was reported in retrospective (case-control) studies involving oil refinery workers (25,26) and chemists (27).

Analysis of data from the Swedish Cancer Registry (28) indicates that standardized incidence ratios (rates of occurrence among workers in an industry as compared with rates for similar persons not in the industry) for gliomas were increased among male dentists; agricultural research workers; public prosecutors; female physicians and other health care employees; welders; metal cutters; glass, porcelain, and ceramics workers; and women employed in wool mills.

Long-term exposure of farm workers and of children raised on farms to pesticides has been associated with development of brain cancer. Those studies link childhood brain cancer with exposure to sick pets and farm animals, suggesting a possible viral etiology (18).

There is some clinical evidence that lead exposure may be linked to a type of glioma in children (18). Those findings were supported by studies in which rats fed diets high in lead developed gliomas. A few studies have shown a possible genetic susceptibility to brain cancers. Certain gliomas have been shown to occur more often in families than among people who are not related. There has been shown to be a significant association between brain cancer in children and the presence of epilepsy in their siblings (18).

Other factors that may be related to the development of primary brain cancer (in particular, meningiomas and gliomas), include high-dose X-rays; consumption of sodium nitrate, a commonly used meat preservative; head trauma (21); use of barbiturates by children and pregnant women (18); exposure to electromagnetic fields (29); and elevated serum cholesterol (30), which may be a marker for elevated socioeconomic status.

### Lung Cancer

Lung cancer is one of the major causes of death in most Western countries, particularly among men. In the United States, lung cancer is the leading cause of death from cancer among men and women, and accounted for approximately 15% of all cancer cases (22% in men, 8% in women) reported in 1980, and for approximately 23% of all cancer deaths (31). Lung cancer has been increasing in most areas of the United States (from 1950 to 1980); the rates have increased most for nonwhite persons and for women aged 20 to 30. An inverse association between lung cancer and socioeconomic status has been observed in several studies (31); that is, the rates of lung cancer are highest in people of lower socioeconomic status. Increased smoking habits among people of lower socioeconomic status may account for that observed difference.

Cigarette smoking is the major cause of lung cancer and is estimated to cause 85% of lung cancer deaths. Tobacco smoke has been shown to interact with some occupational carcinogens, such as asbestos and radon. The risk of developing lung cancer is related to the type of tobacco product smoked and to the duration and frequency of smoking (31).

Occupational exposure to airborne asbestos appears to have a great effect on the risk of developing lung cancer and mesothelioma (a cancer of the lining of the chest cavity, or mesothelium). Epidemiologic studies have indicated that the risk of developing those adverse health conditions is substantially higher for workers in asbestos industries, including miners and millers, and textile, insulation, and shipyard and cement workers. An increased rate of lung cancer has been documented in uranium miners and hard rock miners; it is believed to be related to inhalation of radon daughters. Lung cancer is also one of the major effects of exposure to high doses of ionizing radiation (31).

A number of occupational agents have been shown to contribute to the incidence of lung cancer, including chloromethyl ethers, hexavalent chromium, chromate, cadmium, nickel, inorganic arsenic, formaldehyde, and terpenes (used in wood treating) (32). Several types of occupations have been found to be related to an excess occurrence of lung cancer, even after accounting for the effects of smoking; they include shipyard workers, truck drivers, rubber workers, printers, leather workers, construction workers, and cooks (32).

Lung cancer tends to be more common in urban than rural areas; that difference persists even after controlling for smoking habits (31). Urban air pollution has been suspected as a cause of lung cancer, but it has been difficult to establish a definitive link.

**Genitourinary Disorders (Positive Pap Smears)**

The Papanicolaou (Pap) smear is indicative of cytologic (cell-related) and histologic (tissue-related) events occurring in the development of cervical cancer. The Pap smear is a method of screening cells for cervical intraepithelial neoplasia (CIN) and early invasive carcinoma of the cervix, the precursors of cervical cancer.

Most CIN is described as a process occurring in three stages. The third stage, the higher grade lesions, is regarded as more ominous than the two earlier stages; however, the immediate risk of developing invasive cervical cancer at any one stage cannot be predicted. Cell abnormalities are found in approximately 1% of all Pap smears and in approximately 2.5% of the smears of women younger than age 30. The usual development of CIN, from the first to third stage, occurs over a number of years (18,33).

Cervical cancer is considered a sexually transmitted disease that is seen most often in women who have the characteristics of people at high risk for other sexually transmitted diseases: early age at first intercourse, early pregnancy, low socioeconomic status, a history of any sexually transmitted disease, and, most importantly, a history of multiple male sexual partners. The only factor that has been shown epidemiologically to be independently related to the occurrence of cervical cancer is the number of male sexual partners. That relationship takes into account not only the number of male sexual partners that a woman has had, but also the number of sexual partners that her male partner(s) has (have) had (18).

Information available in the medical and epidemiologic literature does not indicate that environmental chemical factors play an important role in the development of cervical cancer, although the lack of such data does not necessarily rule out environmental chemicals as possible causative agents (18,33).

**Polycyclic Aromatic Hydrocarbons (PAHs)**

A discussion of PAHs is warranted because the presence of cancer-causing substances is an important health concern of the community near the APCM site. It is important to emphasize that the levels of PAHs found at the APCM site are not of public health concern. PAHs found on site are at relatively low levels, and the estimated exposures of on-site workers and nearby residents are negligible. Furthermore, there is no reason to believe that PAHs are migrating off site (in significant or detectable concentrations).

Occupational exposure to elevated concentrations of PAHs has been linked to cancer in coke oven workers (lung cancer and upper respiratory tract tumors) and other related occupations (gas generation, shale oil production) (15). In addition, chimney sweeps historically have had an elevated risk of scrotal cancer, resulting from prolonged skin contact with soot.

PAHs are formed as products of ordinary combustion and thus are widespread in the environment. PAHs bioaccumulate and bioconcentrate in the food chain, but are fairly rapidly excreted. They are found in smoke, cooking oils, smoked meats, charcoal-broiled foods, coal, soot, grains, and cereals. PAHs generally have low water solubility and strong absorption to soil (15).

The main public health concern about PAHs is their potential to cause cancer. However, not all PAHs have been found to cause cancer. Noncarcinogenic PAHs include acenaphthene, acenaphthylene, anthracene, fluoranthene, fluorene, methylated naphthalenes, naphthalene, phenanthrene, and pyrene. Sufficient evidence exists to accept that the following PAHs are carcinogenic: benz(a)anthracene, benzo(a)pyrene, and dibenz(a,h)anthracene by the oral route; benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(j)fluoranthene, benzo(k)fluoranthene, 5-methylchrysene, dibenzo(a,e)anthracene, dibenzo(a,h)anthracene, dibenzo(a,i)anthracene, and indeno[1,2,3-cd]pyrene by the dermal route (15).

The most representative carcinogenic PAH is benzo(a)pyrene (which was found in sediment on site at APCM). In animal studies, PAHs often exhibit their toxic effects locally, at the site of administration. For example, in rodents studies, when benzo(a)pyrene was painted on the skin, it caused skin papillomas; when administered by inhalation, it induced lung tumors. On the other hand, when administered to mice, it increased the incidence of forestomach tumors and lung adenomas (15).

### **Respiratory Tract Problems (Asthma)**

Asthma is a fairly common adverse health condition that may have serious consequences; individuals with asthma have a 1 to 3% mortality rate. Despite available data on the occurrence of asthma, there are no universally accepted criteria to characterize its severity.

The classic definition of asthma was introduced in 1962 by the Committee on Diagnostic Standards for Nontuberculosis Respiratory Diseases (34). The fundamental characteristic of asthma is obstruction of small and large airways, which results in a reduction of airflow throughout the lungs. Airway obstruction increases the work of breathing and may result in respiratory muscle fatigue, wheezing, coughing, and tightness in the chest.

Factors that may elicit an asthmatic response in susceptible individuals include genetic and hormonal factors; occupational and environmental irritants, such as sulfur dioxide, nitrogen dioxide, formaldehyde, cyanide compounds, flour, wood dust, and fumes and smoke (35,36); viral respiratory tract infections (37); and exercise and exposure to cold air (38).

Exposure to high levels of air pollutants, including sulfur dioxide, nitrogen dioxide, and particulate matter in ambient air outside of the work environment has been shown to cause acute and chronic adverse effects to the respiratory tract (39). One study conducted in Helsinki, Finland (39), reported positive, statistically significant associations between ambient levels of sulfur dioxide and both numbers of upper respiratory tract infections diagnosed at local health centers, and absenteeism from day-care centers and work places. The main sources of air pollutants in the Helsinki study were coal- and oil-fired power plants, road traffic, and general industrialization. The weekly mean (average) of sulfur dioxide concentrations ranged from 9 to 62  $\mu\text{g}/\text{m}^3$ ; the mean daily maximum was 53.0  $\mu\text{g}/\text{m}^3$ .

Laboratory models of silica, coal, and asbestos toxicity (40) have led to the prediction that pulmonary fibrosis (lung cancer) is one of the ultimate consequences of human exposure and accumulation of respirable particulate and dusts (e.g., less than or equal to 5 micrometers in the alveolar region of the respiratory tract). Because the studies involve laboratory models rather than human systems, their results may not be appropriate for use in predicting the likelihood of development of cancer in people.

